Control of Emissions from Marine SI and Small SI Engines, Vessels, and Equipment

Summary and Analysis of Comments

Chapter 2
Small SI Engines and Equipment

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

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2 Exhaust Emission Standards and Related Requirements for Small SI Engines

What We Proposed:

The comments in this section generally correspond to Sections V and VII of the preamble to the proposed rule, where we describe the proposed emission standards and certification procedures associated with exhaust emissions from Small SI engines. The applicable regulatory provisions for these proposed requirements are in 40 CFR parts 90 and 1054. The Regulatory Impact Analysis describes the feasibility of these standards, special provisions that apply to small businesses, and alternative standards under consideration in Chapters 4, 10, and 11, respectively.

See Chapter 1 of this document for a discussion of issues that apply more broadly than only for Small SI engines. See Chapter 4 of this document for a discussion of issues related to evaporative emissions.

2.1 Scope and applicability

2.1.1 Definition of handheld

What Commenters Said:

OPEI commented that EPA appears to have two definitions of handheld indicated in 1054.101(c) and 1054.801. In order to prevent the unintended reclassification of these products in 1054.801, OPEI commented that EPA should keep the newly proposed weight limits intact but make a revision to the definition of a handheld engine in 1054.801 by adding paragraph (6) Is used in a portable hand-supported jackhammer/rammer, compactor (vibratory or other) or other similar product. As an alternative, EPA could add a statement to the definition in 1054.801 indicating all engines/product less than 80cc are automatically handheld regardless of weight etc. OPEI also commented that paragraph (4) of the definition should be revised to eliminate "one-person" since many augers using handheld engines can be operated by two-persons.

EMA commented that the NPRM properly categorizes equipment utilizing engines less than or equal to 80cc total displacement as "handheld." The NPRM also correctly categorizes equipment utilizing engines with larger than 80cc total displacement, but also meeting additional requirements, as eligible for categorization as handheld. Such engines should be allowed to continue to meet handheld exhaust standards, and should be considered handheld engines/equipment for purposes of the new evaporative standard requirements. In addition, equipment that EPA has historically approved as meeting the definition of "handheld," such as compactors/rammers, should be allowed to continue to be categorized as handheld and should be specifically included in the regulation in order to ensure that all industry and agency personnel are aware of the appropriate determining factors.

EMA submitted comments on EPA's proposal to modify the handheld definition by increasing each of the specified weight limits by 1 kilogram (72 FR at 28141). EMA agrees that an adjustment is required. However, they commented that the proposed adjustment is insufficient for the conversion of prior emission control engines to either catalyzed two-cycle

engines or four-cycle engines, as required to achieve exhaust emission standards. EMA recommended that the handheld definition be adjusted by increasing each of the specified weight limits by 2 kilograms.

The California Air Resources Board (CARB) believes categorizing handheld equipment is best done by engine size such as the 80cc limit set by California. This gives the engine manufacturers an emissions design target at the beginning of the process. To the extent EPA believes it necessary to maintain the handheld category above 80cc, CARB supports the change in weight limits for handheld equipment. CARB commented that the increase of one kilogram, representing the approximate additional weight related to switching to a four-stroke engine, is an appropriate adjustment.

Honda submitted comments in agreement with EPA's proposal that would allow engines less than 80cc to comply with both handheld exhaust and evaporative emission standards. Honda commented that the language on evaporative emissions should be clarified to include these engines. Additionally, Honda commented that engines above 80cc could then use the equipment-based handheld definitions to quality for the handheld category. Honda recommended that EPA specifically add earth rammers to the handheld category rather than continuing to rely on the Phase 2 guidance that they qualify as handheld products. Finally, with the direct inclusion of 0 to 80cc engines in the handheld emission category, Honda believes the proposal's definition for handheld equipment should be given careful reconsideration. This may be particularly true for products with weight limits of 14 or 20kg. Honda questioned whether it is necessary for generators and pumps less than 14kg (15 kg proposed) to be considered handheld by definition.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691
CARB	0682
Honda	0705

Our Response:

EPA does not believe the regulations contain two different definitions of handheld. The EPA regulations define "handheld" in §1054.801 by specifying the criteria that are to be used to determine if an equipment application is handheld and therefore subject to the various handheld requirements of Part 1054. Section 1054.101 describes which exhaust standards apply to the different types of engines. Paragraph (a) notes that all handheld engines (i.e., those that meet the definition in §1054.801) must meet the handheld exhaust standards. In addition, paragraph (c) notes that all engines at or below 80cc will be subject to the handheld engine standards, regardless of the type of application the engine is ultimately placed in. The provision in paragraph (c) does not mean the engine is a handheld engine. It only means that the engine is subject to the handheld exhaust standards. Therefore, EPA believes both of the regulatory provisions noted above are necessary and have been retained in the final rule.

In response to the comment on the 80cc cutpoint, EPA cannot use 80cc as the only criteria for whether an engine is subject to the handheld exhaust standards because there are many products that use engines above 80cc which qualify under the criteria contained in the handheld definition of §1054.801. CARB uses the 80cc cutpoint in its regulations. However, CARB's regulations do not apply to those products above 80cc considered handheld under EPA's definition due to the construction and farm equipment pre-emption provisions of section 209(e) of the Clean Air Act. Therefore, EPA is retaining a definition of "handheld" in the final rule.

It should be noted that the proposal based the cutpoint for the applicability of the handheld provisions on engines "less than" 80cc. As noted in the proposal, this change was intended to harmonize with the displacement-based requirements for CARB. During development of the final rule, it came to EPA's attention that the CARB cutpoint is based on engines "at or below" 80cc. EPA has modified the final rule regulations to include this approach so that the EPA and CARB requirements are the same.

With regard to the comments on hand-supported jackhammers, rammers and compactors, EPA agrees that the definition of handheld should include a specific reference to such applications. In response to requests from equipment manufacturers in the past, EPA has approved the manufacturers' request to consider such applications as handheld based on the criteria spelled out in the handheld definition on multi-position use. Therefore, EPA believes it makes sense to include the hand-supported jackhammers, rammers, and compactor applications specifically in the handheld definition.

With regard to the comment on augers, EPA is removing the "one-person" term from the auger description in the handheld definition. EPA acknowledges that some augers can be operated by two people, but still have other attributes that would lead to the equipment being considered a handheld application, including the dry weight of the equipment. Therefore, EPA believes the "one-person" terminology is not needed with respect to augers.

In response to the comments on whether a special provision for pumps and generators is needed given the requirement that all engines at or below 80cc can meet the handheld standards, EPA investigated the current certification information to see how many engines above 80cc are used exclusively in pumps and generator applications that would fall under the 15 kilogram weight limit (engine and equipment combined) included in the proposed definition. While EPA was able to identify a few engine model used in such applications, sales of such engines were extremely low. EPA sees no technical reason why such applications would need to use engines certified to the handheld standards and is therefore removing the pump and generator language from the handheld definition in §1054.801 of the regulations

In response to the comments on the proposed weight limits in the handheld definition, EPA looked at similar equipment applications in which the engine is similarly sized, but powered by either a 4-stroke engine or a 2-stroke engine. Based on an analysis of similarly designed string trimmers, the dry weight of a 4-stroke trimmer with a 25 cc engine was advertised at 13 pounds, whereas the dry weight of two different 2-stroke trimmers with similar sized engines (24.5cc and 28cc) was advertised at 9.5 and 10.6 pounds. Therefore the 2-stroke

trimmers were 3.5 and 2.4 pounds (1.6 and 1.1 kilograms) lighter than the 4-stroke trimmer. Based on this comparison, EPA agrees that it is reasonable to raise the weight limits in the handheld definition by 2 kilograms instead of the proposed 1 kilogram increase to account for the increased weight of switching to a 4-stroke engine. Therefore, EPA is adopting a 16 kilogram weight limit in the handheld definition for most equipment with a 22 kilogram weight limit for augers.

Finally, with regard to Honda's comments that the language on evaporative emissions should be clarified to include all engines at or below 80cc under the handheld evaporative requirements, EPA agrees in principle. For the purposes of the exhaust emission standards, engines at or below 80cc are subject to the handheld exhaust standards. Under the new regulations, equipment manufacturers are allowed to use engines at or below 80cc in either handheld or nonhandheld equipment. Because the applicability of the evaporative emission standards is based on the type equipment, an engine at or below 80cc used in a nonhandheld piece of equipment (that is subject to the handheld exhaust standards) would be subject to the nonhandheld equipment evaporative standards. EPA believes this could be difficult, especially with regard to running loss requirements that apply to nonhandheld equipment but not handheld equipment. Therefore, the final regulations require nonhandheld equipment to comply with the nonhandheld evaporative emission standards unless it is using an engine at or below 80cc. In that case, the equipment manufacturer would need to demonstrate compliance with both the fuel line and fuel tank requirements in 2012. The running loss requirement would not apply to nonhandheld equipment using engines at or below 80cc. (It can be noted that EPA is adopting a similar provision for nonhandheld engines which are used in handheld equipment. In such a case the equipment would be subject to the handheld evaporative emission standards which do not require control of running losses. The fuel line and fuel tank requirements would apply and take effect in 2012.)

2.1.2 Small SI vs. Large SI

What Commenters Said:

EMA noted that the current differentiation between Small SI and Large SI nonroad engines is principally determined based on the power of the engine (e.g., less than or equal to 19 kW). In addition, engine manufacturers have the discretion to categorize engines that have power greater than 19 kW, but less than or equal to 30 kW, with total engine displacement less than or equal to 1,000 cc, as Small SI engines. The current differentiation should not be changed.

EMA noted that the NPRM introduces restrictions regarding total engine displacement through the addition of one significant figure to the displacement determination, and provides a clarification stating that all engines produced must be included in the displacement determination. Such clarification requires that all production tolerances be included in the determination of maximum production displacement. EMA commented that the regulatory requirements should be clarified in order to avoid confusion regarding the product category applicability, and the final rule should include the proposed clarification that all engines, including tolerances, must be within a category. However, the proposed additional significant

figure for representation of engine displacement is not necessary. In fact, the addition of such significant figure may result in unintended consequences associated with engine designs that are currently classified as Small SI. Accordingly, EMA commented that EPA should not require that engine displacement be calculated to an additional significant figure.

EMA noted that §90.116(a) requires the total engine displacement to be rounded to the nearest whole cubic centimeter, but paragraph (g) requires the total displacement to be rounded to the nearest 0.1 cc. EMA suggested that §90.116(g) be revised to reflect the nearest whole cubic centimeter as required by §90.116(a).

EMA commented on §1054.615(b) "What is the exemption for engines certified to standards for Large SI engines?" EMA noted paragraph (b) refers to paragraph (f) of the same section, however the section does not include a paragraph (f). EMA believes the correct reference should be to paragraph (d).

Kohler noted that EPA is proposing to modify the criteria used to determine the displacement for the large SI one liter exemption. Kohler commented that it is opposed to this change. Kohler provided comments on specific sections in the proposed regulations. They noted that §90.116(g) has been added which limits the displacement of each engine produced to 1000.0 cc after rounding to the nearest 0.1 cc. This is a change to the previous requirement of calculating displacement using nominal engine values and rounded to the nearest whole cubic centimeter. This changes the rules established in §1048.6l5(a)(l) and 90.l 16(a) after the regulations have been implemented. Kohler requested that the previous wording be retained. If it is not, any engine families certified to the current Part 90 wording should be grandfathered and this change should not take effect until the Phase 3 regulation is implemented in 2011. Kohler noted that §1054.140(d) limits the displacement of each engine produced to 1000.0 after rounding to the nearest 0.1 cc. This is a change to the previous requirement of calculating displacement using nominal engine values and rounded to the nearest whole cubic centimeter. Kohler doesn't believe this change is justified and requested the current wording in Part 90.116 be retained.

Letters:

Commenter	Document #
EMA	0691
Kohler	0703

Our Response:

We agree with the commenters' position that the differentiation between Small SI and Large SI engines should not be changed, and specifically that the 1000 cc threshold should not be changed to 1000.0. If we had done this originally, manufacturers could have easily planned for that and taken steps to ensure that nominal engine dimensions and production tolerances were adequately controlled to stay below the threshold. Since we did not adopt the more precise threshold, manufacturers have in good faith designed their engines consistent with the regulations as published. We do not believe there is a sufficient environmental benefit corresponding to the more precisely defined threshold to justify the costs associated with modifying engine designs in this way.

The concern related to ensuring that every engine is below the threshold comes from the realization that we might have had a difficult time establishing that there was a violation if the manufacturer had declared a nominal value that was below the threshold, even though production variability could arguably lead to substantially higher displacement values. In the context of highway motorcycles that are subject to different standards if they are over 50 cc, we have seen examples of wide variations in displacement values above 50 cc where the manufacturer claimed to be in compliance with regulatory requirements. Kohler has pointed out that their particular situation involves production variability that would be problematic if the threshold were 1000.0 cc, but not if the threshold were 1000 cc. We are modifying the regulatory language to specify that the declared displacement value must be within the range of actual values for production engines, taking into account normal production variability. This approach is similar to what we specify for declaring maximum engine power in §1054.140. This should allow us to meaningfully implement and enforce the 1000-cc threshold without changing the meaning of the current regulations for those who are already complying in good faith.

We have modified the regulation language to more clearly state that engines voluntarily certified to the exhaust emission standards for Large SI engines in part 1048 are also subject to evaporative emission standards under part 1048. Since Large SI evaporative requirements fall to the engine manufacturer, there should not be a situation where an equipment manufacturer becomes subject to EPA standards because of the engine manufacturer's choice to certify to more stringent exhaust emission standards. In fact, equipment manufacturers may in the end meet evaporative requirements for Small SI engines (especially for running loss control) even though they don't need to. This would not be a violation. We believe this regulatory arrangement represents the clearest and most natural division of responsibilities among the affected companies.

2.1.3 Maximum engine power and displacement

What Commenters Said:

EMA believes the NPRM introduces significant additional complexities with respect to the determination of maximum power. EMA commented that the final rule should clarify that the power reported by the engine manufacturer may appropriately be determined utilizing the engine manufacturer's good engineering judgment and the appropriate industry standard for power measurement.

EMA commented on §1054.140 "What is my engine's maximum engine power and displacement?" EMA believes the proposed language is both excessive and incomplete. Specifically, they commented that the requirement to map engines pursuant to 40 CFR Part 1065 is not appropriate for small air cooled Small SI engines, and the maximum engine power does not specify a rating procedure. The proposed requirement to include all engines in the displacement determination, as well as including the additional significant figure to the displacement reporting is not appropriate. EMA believes this section should include only those requirements that are significant to the determination of whether an engine family should be

classified as a Small or Large SI engine. Accordingly, EMA commented that this section should be revised to read as follows:

> (a) An engine configuration's maximum power is the power level assigned by the engine manufacturer as determined using an industry standard power measurement procedure. Engine families where the maximum modal power of the emission-data engine is greater than 15 kW at the test speed designated require manufacturers to include the brake power for engines in the certification application for the family as prescribed by 1054.205.
> (b) An engine configuration's displacement is the intended swept volume of all the engine's cylinders. The swept volume of the engine is the maximum product of the cross section area of the cylinder bore, the stroke length, and the number of cylinders including all tolerances. Determine the final value by rounding the final result to the nearest 1 cc.
> (c) Deleted in its entirety.
> (e) Deleted in its entirety.

EMA noted that §1054.1(a)(1) states that the requirements of Part 1054 apply to engines with "maximum engine power at or below 19kW." EMA commented that it is not clear what type of power level is being described. As the definitions set forth in §1054.801 include a definition of "brake power," EMA commented that §1054.1(a)(1) should be revised to read as follows: "maximum engine brake power at or below 19kW."

OPEI noted that EPA explains in 1054.205(a) that this section only applies if the engine is 15 kW or greater. OPEI commented that the language of §1054.140 should be modified to explain it is not applicable to engines less than 15 kW or less than 0.95 liters.

Kohler noted that §1054.801 defines "Displacement" to have the meaning given in 1054.140, which is changed from the current provisions in §90.116. Kohler commented that the current meaning in §90.116 should be retained. Kohler also objected to the extensive reporting and recordkeeping requirements in the proposed rule. One of the items Kohler noted was the requirement to report maximum engine power in the application for certification.

Letters:

Commenter	Document #
EMA	0691
OPEI	0675
Kohler	0703

Our Response:

Appropriately defining terms to establish an engine's displacement and maximum engine power are important for ensuring that the regulations specify objectively and consistently which emission regulations apply. Every engine should be unambiguously subject to a single set of emission regulations—there should be no overlaps or gaps. For maximum engine power, the regulations need to differentiate Small SI engines from Large SI engines (and in some cases from recreational vehicle engines). For displacement, the regulations need to assign each engine to a Class for determining which standards apply under part 1054. EMA accurately summarizes our

objective by stating that we should "include only those requirements that are significant to the determination of whether an engine family should be classified as a Small or Large SI engine."

Part 90 in particular does not include such procedures and specifications for establishing clear and objective determinations of power and displacement. We have chosen to adopt the new approach in part 1054 in combination with the Phase 3 standards rather than introducing these regulatory provisions as amendment to the Phase 2 program in part 1054. Such a change could cause unintended consequences by forcing an engine to be subject to a different set of standards even though we are intending to leave the current standards intact.

To accomplish this, the regulations must use consistent and objective parameters for making these determinations. It would not be appropriate to rely on a manufacturer's judgment in establishing maximum engine power, because it would be impossible to ensure a proper delineation between Small SI and Large SI engines. Without an objective specification or procedure, manufacturers would be free to manipulate the declared value to choose the less stringent standards. Both maximum engine power and displacement can be measured using standard procedures and specifications, so we believe the regulation should rely on these procedures and specifications to determine those values.

While engine mapping is not required to test Small SI engines, we believe it is entirely appropriate to do engine mapping for engines where there is a need to demonstrate that the engine's power falls within the specifications for regulation as a Small SI engine. Mapping procedures are specified in part 1065. This measurement can be readily made when an engine is mounted on an engine dynamometer. The specified mapping procedure and the instructions for determining maximum engine power constitute a complete rating procedure for these engines. This may be different than the manufacturers' current practice, but it is a rating procedure nonetheless.

We specify that the power and displacement values determined under §1054.140 fall within the range of actual values from production engines. Any departure from this would clearly be inappropriate, since the production engines clearly would not be appropriately represented by those values determined during the certification process. We describe in Section 2.1.2 how we specify displacement limits relative to the 1000 cc threshold for Large SI engines.

The regulations use consistent and appropriate terminology to characterize maximum engine power. Brake power is a separately defined term to clarify which accessory loads are properly counted toward any measured power value. The regulations in §1054.140 simply specify that maximum engine power is the maximum value of an engine's measured brake power over an engine map.

It would not be appropriate to limit the applicability of §1054.140. This section establishes definitions and specifications that dictate how the regulations apply. These definitions apply universally, but by themselves they require no action. Other regulatory provisions, such as the requirements to report maximum engine power in §1054.205, determine whether action is required to make a demonstration.

We proposed to require manufacturers to report their maximum engine power for engines with a measured power at or above 15 kW under the specified emission test procedure. This was intended to require this reporting only as needed to ensure that engines were not exceeding 19 kW based on the proposed approach to defining maximum engine power. We believe we can more carefully craft this provision, given the 30 kW threshold that applies for engines with total displacement at or below 1000 cc. As a result, we are modifying the regulation to require reporting of maximum engine power only where the maximum power for testing is at or above 25 kW for engines with total displacement at or below 1000 cc, and above 15 kW for larger engines.

2.1.4 General concerns

What Commenters Said:

J. Snell would like to urge EPA to leave small engines exempt from emission controls. The commenter believes it would raise the price of items like lawn mowers, pressure washers and go karts which do not have a large enough impact on the environment to justify this increase especially in rural areas. The commenter stated EPA could at least consider a horsepower or a cubic centimeter limit. The commenter also believes that 4 cycle motorcycles should also be exempt for they are a tiny percentage of the machines in the world that put out emissions.

Letters:

Commenter	Document #
J. Snell	0623

Our Response:

The Clean Air Act directs us to set emission standards for nonroad engines, including all Small SI engines, such that we achieve that greatest degree of emission control possible after considering lead time, costs, and other factors. We have made an extensive effort to set standards that are achievable with costs that are commensurate with the air quality benefit associated with the reduced emissions. We are not changing the emission standards that apply for highway motorcycles.

2.2 Standards and lead time

2.2.1 NHH standards–level

What Commenters Said:

EMA noted that they were an active participant in the development of the NPRM for the next-phase Small SI engine standards. EMA commented that the net result of that collaborative process is an NPRM that truly and properly reflects the maximum achievable emission reductions for Small SI engines and the equipment that they power. EMA commented that the rulemaking has set forth extremely challenging and dramatic, but nonetheless potentially

achievable, emission reduction targets. Indeed, EMA believes the effort that has gone into this collaborative rulemaking has resulted in the promulgation of an overall framework of technology-forcing standards and accompanying regulations that are at the very limit of feasibility and implementability. As a consequence, EMA commented that the overall framework needs to be maintained in the final rule, since any potential increased stringency of the proposed standards or the overall regulatory program would necessarily result in an infeasible and non-implementable rule.

EMA commented that exhaust emission control technologies for ground supported Small SI engines are similar to, but cannot be derived from, other nonroad engine applications or on-highway applications. Ground supported Small SI engines and the equipment that they power operate under significantly different environmental and cost considerations. Such considerations pose major obstacles to any wholesale transfer of advanced exhaust emission control systems and necessarily prevent the fuel and exhaust control technologies used in on-highway (or even nonroad large spark-ignition) from being applicable to these products.

MECA commented that it supports EPA harmonizing HC+NOx exhaust emission standards for Class I and Class II engines used chiefly on nonhandheld equipment with the CARB standards that were adopted in 2003 and began their implementation in 2007. MECA also concurs with the EPA staff analysis and conclusion that the proposed Phase 3 HC+NOx exhaust emission standards for Class I and Class II engines are technologically feasible and that catalyst technology can be fully optimized as part of a complete engine/emission control/exhaust system to help achieve these proposed limits.

MECA noted that both EPA and CARB test programs have shown that catalysts can be applied to Class I and Class II engines without increasing safety risks associated with exhaust component surface temperatures. Integration of catalyst into small engine mufflers utilizes uncomplicated manufacturing techniques that should allow for the design and validation of compliant engines within the lead-time provided by the EPA regulations. The 30 years of catalyst experience in general and the over 10 years of experience with applying catalysts to smaller SI on-highway and nonroad engines provide an experience base that has enabled catalyst technology to continue to be improved. This small engine experience has provided an increased understanding of how to optimize the engine/catalyst/exhaust system to work effectively, and will facilitate application of catalyst technology on Class I and Class II engines to help meet the proposed standards.

MECA commented that issues raised by small off-road engine and equipment manufacturers, such as heat management, packaging, poisoning, and durability, are straightforward engineering challenges that are well understood and can be readily addressed. They noted that these types of issues have been raised virtually every time the use of catalyst technology has been proposed for use on a spark-ignition engine, be it an automobile, heavy truck, off-road engine over 25 hp (such as a forklift), a motorcycle or moped, or a small engine used on handheld or non-handheld equipment. In each case, all of these issues were successfully addressed for each application through sound engineering principles and design strategies. MECA believes the situation is no different in the case of Class I and Class II nonroad engines.

CARB supported the HC+NOx exhaust emission standard levels proposed by EPA.

NESCAUM supported EPA's effort to harmonize the federal emissions standards with those standards already adopted in California. In many respects, the proposed federal standards are identical to or analogous with California standards. This approach will make it easier for the engine and equipment manufacturers to provide 50-state products to the U.S. market.

Environmental Defense supported EPA's proposal to set more stringent HC and NOx standards for Class I and II nonhandheld small spark-ignition engines and a new CO standard for use in marine generator applications. These Phase III standards can be met by the use of catalysts, improved engine or fuel delivery systems, or the addition of electronic controls or fuel-injection systems. According to EPA, several engine families selling nationwide currently produce engines that meet the proposed Phase III standards. Therefore, "a number of families either will not need to do anything or will require only modest reductions" in order to comport with the new federal standards. The proposed standards are consistent with those previously adopted by CARB. Once in place, EPA's proposal should achieve emissions reductions of approximately 35% below the current federal levels.

The National Association of Clean Air Agencies (NACAA) commented that it supports the federal adoption of exhaust emission standards for small spark-ignition engines consistent with those adopted by the California Air Resources Board. Based on the EPA's March 2006 safety study and the Regulatory Impact Analysis for this proposal, as well as public statements by engine makers, it is evident that additional, more stringent emission standards are feasible for small spark-ignition engines, especially commercial equipment, which operates hundreds, if not thousands of hours a year. Therefore, NACAA recommended that EPA consider adding another tier of more rigorous standards for Class I and Class II engines.

The Pennsylvania Department of Environmental Protection (DEP) commented that it supports EPA's adoption of a regulation for small spark-ignition engines and equipment that is consistent with regulations adopted by the CARB. Consistent with EPA's findings set forth in the March 2006 Safety Study and the Regulatory Impact Analysis for the proposed rulemaking, the Pennsylvania DEP recommended that EPA add a tier of more stringent standards for Class I and Class II engines.

The Mid-America Regional Council (MARC) Air Quality Forum commented that because EPA and small engine manufacturers have both asserted that Class I and II engines can be feasibly designed to meet emissions standards more rigorous than those in the proposed rule, EPA should consider incorporating an additional tier of more stringent standards.

The Wisconsin Department of Natural Resources (DNR) commented that EPA should consider adding another tier of more rigorous emission standards for Class I and Class II spark-ignition engines as more stringent emission standards are feasible for these engines, especially commercial equipment, which operate hundreds, if not thousand of hours a year.

The New York Department of Environmental Conservation (DEC) noted that EPA is proposing standards similar to existing California standards for small spark-ignition engines.

The proposed standards, to be implemented in 2011 and 2012, will result in a 35% reduction in combined hydrocarbon and NOx emissions for engines in non-handheld equipment. The New York DEC noted that it is well aware of industry opposition to these proposed regulations, and supports expedient adoption of the standards as proposed. They also believe that further emissions reductions are needed, and will be feasible in the future.

Environmental Control Corporation (EVCC), a developer of catalytic mufflers for small spark-ignition engines (both two-stroke and four-stroke) commented that their technology has proven HC+NOx reductions of up to 98.9% on a two-stroke engine and 90% on a four-stroke engine while also significantly reducing CO. They noted that they are in full support of the current regulations, but they encouraged EPA to set even more stringent standards in the near future.

EVCC provided information on their catalytic mufflers. First, EVCC noted that its patented catalytic muffler is linearly designed and can be modified to fit virtually any spark-ignition engine. EVCC has successfully completed emissions testing for a variety of engine applications (both two-stroke and four-stroke), including lawn mowers, snowmobiles, out-board motors, water-pumps, and more. The company just recently completed a durability test on a 163 cc four-stroke engine (in compliance with EPA and CARB certification parameters), and is currently in the process of completing durability testing for a two-stroke application. Second, EVCC noted that its catalytic mufflers are both cost-effective and compact in size. The unique airflow design of these mufflers allows them to achieve unprecedented emission reductions while using minimal materials and space. In its most recent 163cc four-stroke test (lawn-mower application), EVCC noted that its catalytic muffler was smaller than that of the OEM and did not require external air, baffles, perforated pipes or sound chambers.

EVCC noted that it is very concerned that EPA plans to continue regulating the emissions of small non-road engines by grouping HC and NOx together as one value. EVCC commented that manufacturers of four-stroke spark-ignition engines (i.e. lawn and garden equipment) are able meet both current and future emission regulations for CO and HC+NOx by engine modifications and minor carburetor calibrations (by running the engine on a lean fuel mixture, for example). While EVCC believes these engine modifications and minor carburetor calibrations will reduce CO and HC, in most instances there will be a concomitant increase in NOx. This is highly undesirable, as increases in NOx will have a drastic impact on both human health and the environment.

EVCC noted that the emission regulations in which HC and NOx are combined together for a total emission certification value permits an increase in NOx levels as a trade-off to reducing HC. This loop-hole is completely unnecessary in the small engine sector, as three-way catalytic converters are fully capable of reducing all three emission values simultaneously. In addition, NOx is one of the most harmful by-products of fossil-fuel combustion, and manufacturers should by no-means be permitted to increase NOx levels needlessly. All three of the emission values in question are individually regulated in the automotive sector, and it is now time to carry this practice to the small engine industry.

Frank Smith, a retired Chemistry Professor from the Memorial University of Newfoundland, commented that in changing the emission regulations applicable to small spark-ignition engines, the requirements should be set such that the technology exists to achieve the levels selected. In that respect, the ability of catalytic mufflers developed by Environmental Control Corporation (EVCC) should be seriously considered. These devices have been tested both at Environment Canada's test facility and at Carnot Emission Services establishment. In January 2007, at the latter facility, results over an extended test of 125 hours, achieved for a four-stroke engine (Honda GX-160), included NOx emissions of less than 0.5 g/kW-hr, HC emissions of less than 5 g/kW-hr, and CO emissions of less than 300 g/kW-hr of operation, without reduction of performance.

In the same tests the combined HC+NOx emissions were also less than 5 g/kW-hr. Consequently, for all pollutants considered the emissions were well below those of current CARB regulations and also those proposed by EPA. In June 2006, tests of EVCC's catalytic muffler fitted to a two-stroke 185 cc Class I nonhandheld engine at Environment Canada's test facility gave similarly low emissions of all three pollutants. A six-mode test (in accordance with US EPA and CARB regulations) using 20 LPM of air injection in the catalyst was conducted by officials at Environment Canada. Of particular interest is the 99 % reduction achieved in hydrocarbon emissions from around 250 g/kW-hr with the original muffler to 2.5 g/kW-hr with the catalytic muffler. This data strongly suggests that control of all three pollutants separately is feasible at levels below those currently proposed.

Letters:

Commenter	Document #
EMA	0691
MECA	0668
CARB	0682
NESCAUM	0641
Environmental Defense	0648
NACAA	0651
Pennsylvania DEP	0676
MARC AQ Forum	0696
Wisconsin DNR	0663
NY DEC	0659
EVCC	0608
EVCC	0654
F. Smith	0694

Our Response:

Section 213(a)(3) of the Clean Air Act specifies the criteria EPA must use in establishing new emission standards. Under the statute, EPA is directed to set emission standards that achieve the greatest degree of emission reduction achievable through the application of technology which EPA determines will be available for the engines or vehicles to which such standards apply, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated

with the application of such technology. In addition, and specific to this rulemaking only, under section 205 of PL 109-54, EPA, in coordination with other appropriate federal agencies, was required to complete and publish a technical study analyzing the potential safety issues associated with the proposed standards, including the risk of fire and burn to consumers in use. The technical study was to be completed and published before the publication of the notice of proposed rulemaking. Given these criteria and requirements and our assessment of the comments, EPA continues to believe that the proposed Phase 3 standards are the appropriate standards for nonhandheld engines for the years in which they were proposed for implementation. (See Section 2.2.2 for further discussion of the comments on lead time for the Phase 3 nonhandheld engine standards.)

The Phase 3 standards for nonhandheld engines are technology forcing and are expected to result in the use of modified calibrations, engine improvements, catalysts, and fuel injection to achieve the required emission reductions. The mix of technologies will vary depending on the engine design. As detailed in Chapter 4 of the Final RIA, EPA developed several aftertreatment and fuel-injection systems to demonstrate that the Phase 3 standards could be met. In addition, EPA assessed the impacts of the new standards on cost as detailed in Chapter 6 of the Final RIA. Finally, EPA expended considerable effort in analyzing the potential safety impacts of engines designed to meet the proposed Phase 3 standards to comply with the requirements of section 205 of PL 109-54. ("EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower," EPA420-R-06-006, March 2006, docket item EPA-HQ-OAR-2004-0008-0333.) Taking all of this information into consideration, EPA believes the Phase 3 standards meet the criteria specified in the Clean Air Act for the time frame in which the standards are to be implemented.

EPA received several comments that we should set more stringent standards than those being adopted today, but we do not concur. All of these commenters except one (as noted below) provided no supporting analysis or data on any of the relevant statutory factors in support of their request. One commenter did submit emission data showing very low emission levels for a Class I engine. In fact, EPA itself generated emissions data for the proposal showing low levels as well. For example, in Class I, EPA tested a number of engines that had HC+NOx emission levels as low as 3.9 g/kW-hr at low hours and were projected to be as low as 5.7 g/kW-hr HC+NOx at the end of their regulatory useful life. Likewise, for Class II engines, EPA tested engines with HC+NOx emission levels as low as 1.8 g/kW-hr at low hours and projected to be as low as 2.3 g/kW-hr at the end of their regulatory useful life. (All of the emissions data generated by EPA and summarized here, is presented in Chapter 4 of the Final RIA.) However, as noted above, the requirements for establishing new emission standards are dependent on more than demonstrating certain emission levels. So while EPA had its own emission data showing lower emission levels are achievable, EPA determined for the proposal that under section 213(a)(3) of the CAA, the Class I standard of 10.0 g/kW-hr HC+NOx and the Class II standard of 8.0 g/kW-hr HC+NOx were the appropriate emission standards. Section V.G. of the proposed preamble and Chapter 4 of the Draft RIA for the proposed rule laid out EPA's assessment of the proposed standards in the context of all of the CAA criteria. As noted above, none of the commenters asking for more stringent standards addressed these other factors.

In addition, in Chapter 11 of the draft RIA for the proposed rule, for both Class I and Class II engines, EPA considered the appropriateness of more stringent emission standards (i.e., 8.0 g/kW-hr HC+NOx for Class I engines and 4.0 g/kW-hr HC+NOx for Class II engines) based on the CAA criteria. EPA noted that while more stringent standards may be feasible, EPA concluded that more leadtime would be required for such standards. This was based on the fact that more stringent standards would require more fundamental and significant changes in engine design in both Classes I and II. For Class I engines, we projected that manufacturers would likely need to convert their side valve engine designs (which represent two-thirds of sales currently) to overhead valve designs along with using a more efficient catalyst and addressing emissions deterioration. For Class II engines, we projected that manufacturers would need to convert all engines to fuel injection, upgrade their residential engine designs to improve emissions deterioration characteristics (e.g., those with a 250 hour useful life), and use a more efficient catalyst. Such redesigns would involve significantly more development work for all manufacturers (and likely more cost) compared to the changes projected for the Phase 3 standards adopted in this rule. This could not happen as soon as the 2011 and 2012 timeframe being adopted for the Phase 3 standards, and would result in a delay in achieving air quality benefits.

In further response to comments that EPA should have promulgated more stringent standards than we proposed, it is important to note that setting more stringent standards for either Class I or Class II or both, would require a more robust analytical record. Those suggesting that more stringent standards should be established now (either in a single or two phases) did not provide input on factors such as cost, lead time, and the other CAA criteria for public consideration. EPA could have pursued such further analysis at this time, but it would likely have required an additional notice/comment step which would further delay this action. The states with air quality problems would benefit more from the earlier reductions due to the standards being adopted in this final rule rather than waiting for further reductions. Therefore, EPA concluded that the proposed Phase 3 standards (which we are adopting with today's rule) are the appropriate standards under the CAA.

With regard to the comment on having separate HC and NOx standards instead of a combined HC+NOx standard, EPA is retaining the standards based on a combined HC+NOx level as is the case with the current Phase 2 standards. EPA believes a combined standard offers flexibility to manufacturers in designing technology to comply with the standards, especially since not all engine designs respond identically to the same control techniques in catalyst design where it is generally easier to reduce HC emissions compared to NOx emissions. While it is true that mathematically a combined standard could result in a decrease in overall HC+NOx emissions with a rise in NOx (or HC), EPA does not expect that would happen to any significant degree as manufacturers redesign engines to comply with the Phase 3 standards. This is especially true if a manufacturer uses a catalyst to comply with the Phase 3 standards because a catalyst would be expected to reduce both HC and NOx, although not at the same rate. This also would likely be true for those engines that might rely on engine modifications to comply with the Phase 3 standards. The latter conclusion is based on a comparison of three 2008 model year Class II engine families that have certification levels below the Phase 3 standards compared to similarly sized Phase 2 engines from the same manufacturer. For this comparison, all of the engines were OHV engines and were certified without catalysts. In all three cases, the overall

HC+NOx emissions for the 2008 model year engines were lower by up to 27 percent, and the individual HC levels and NOx levels were also lower. While most of the decrease in HC+NOx emissions was from decreases in HC emissions, the NOx emissions decreased in all cases as well. Therefore, while a combined HC+NOx standard has the potential to lead to higher levels of one pollutant relative to that pollutants level under the Phase 2 requirements, EPA believes that the Phase 3 HC+NOx standards should also result in lower HC emissions and lower NOx emissions for the fleet.

Additionally, it should be noted that the Phase 3 standards being adopted by EPA are the same as those adopted by CARB, which are based on the combined HC+NOx level. Having the same requirements as CARB helps manufacturers by allowing them to certify the same designs with both agencies, which might not be possible if EPA were to adopt separate HC and NOx standards. In addition, it is important to note that the further control of HC and NOx emissions from these engines is being driven by the need to reduce ambient ozone concentrations. Both HC and NOx contribute to the formation of tropospheric ozone, so a slight mix in the relative reductions among engine designs does not deter achieving the ozone air quality improvement goal which is a key basis for this action.

2.2.2 NHH standards–lead time

What Commenters Said:

OPEI commented that under Section 213 of the Clean Air Act, EPA must make sure that adequate lead-time is provided to allow all equipment manufacturers, as well as their separate engine and exhaust system suppliers, to develop and test the new materials, technologies, and safeguards, including low-permeation fuel tanks and catalyzed-exhaust systems, and to ensure operational risks are mitigated under all the expected operating conditions including off-nominal conditions. As long as they are provided with adequate lead-time and the other related flexibilities, OPEI noted that its members will be able to design their products to utilize catalyzed exhaust systems that would be required to meet the proposed EPA Phase 3 standards. OPEI provided a number of reasons why any acceleration of the proposed Phase 3 effective dates or dilution of the proposed lead-time flexibilities would undermine and potentially jeopardize the manufacturers' ability to build and test products to ensure they would not have any incremental risks.

First, the inclusion of aftertreatment systems into an equipment manufacturer's exhaust system will require a much broader set of changes than just packaging the catalyst into an existing muffler, as implied by the EPA in the proposed Preamble discussion. Second, non-integrated equipment manufacturers must work closely with a variety of suppliers to design and install all the different components into the final product. Third, it will take an extraordinary amount of time and effort to develop a single piece of equipment with an effective and safe catalyzed muffler that has been thoroughly evaluated – under both nominal and off-nominal conditions. Fourth, given the volumes and diversity of these Class II exhaust systems, and limited resources, OEMs are concerned that there will be several bottlenecks (with all their suppliers, independent test labs, and certification officials) that will further delay the production and certification process. Fifth, most of the non-integrated equipment manufacturers expect they

will be forced to offer only limited CARB, Tier III-compliant products for the California market. The national market will require the industry to address many of the most challenging muffler applications and configuration that will not be offered in California.

MECA commented that EPA's proposal to implement the exhaust emission standards for Class I and Class II engines in the 2011-2012 timeframe provides more than adequate lead time for engine and equipment manufacturers. MECA urged EPA not to push out these implementation dates beyond the proposed 2011 and 2012 dates. MECA believes that an even faster implementation schedule for these exhaust emission standards is feasible given the implementation schedule adopted by California.

CARB commented that they believe the timing of the new standards should be implemented sooner. Small spark-ignition engine manufacturers have already been preparing to meet the California standards which are the same as EPA's proposed standards. The manufacturers already have the technological ability to meet the standards. Under EPA's current proposal, manufacturers of Class II engines will have three years from the time California standards have gone into effect and Class I engine manufacturers have five years. It should not take these manufacturers three to five additional years to meet these standards nationwide, particularly since EPA also allows for credit generation which gives manufacturers additional flexibility. CARB suggested that an alternative would be for EPA to give the manufacturers that do not currently sell their products in California extra time to meet the standards.

CARB recommended that EPA modify its proposed HC+NOx phase-in schedule for large spark-ignition engines $\leq$ 1 L to harmonize with the California small off-road engine exhaust emission standards for Class II engines, 8 g/kW-hr at the 2008 model year. This would provide for significant emission reductions from this category. Furthermore, a harmonized program would help reduce the problem of higher emission 49-state large spark-ignition engines traveling into the California fleet.

NACAA questioned the need for the substantial additional lead time that EPA has proposed beyond the implementation dates enacted by California – five years (until 2012) for Class I engines and three years (until 2011) for Class II engines. They believe an accelerated federal schedule is technically feasible and recommended that EPA give consideration to more rapid implementation.

Pennsylvania DEP commented that they are concerned about the need for the substantial additional lead-time of three to five years proposed by EPA and strongly suggests more rapid implementation to afford greater protection of human health and the environment.

The MARC AQ Forum noted that the proposal sets implementation deadlines 2012 for Class I engines and 2011 for Class II engines. They urged EPA to accelerate its implementation timeline.

NESCAUM commented that they oppose the protracted timelines for compliance with the standards, proposed for manufacturers of small land-based SI engines and equipment. The analogous California exhaust emissions standards are fully phased-in between 2005 and 2008. In

contrast, the proposed phase-in period for the proposed federal standards does not even begin until 2010 and, with special provisions afforded to small to medium volume manufacturers, full compliance is delayed until as late as 2014. NESCAUM does not believe there are valid reasons for delaying the incorporation of Phase 3 engines into various types of equipment nationally when manufacturers will already be supplying the California market with lower-emitting Phase III engines and equipment years earlier. This approach for protracted delays is inconsistent with the approach taken in the same rulemaking for SD/I marine engines where EPA chose to closely track effective dates for the California standards: "EPA is proposing that the Federal SD/I standards take effect for the 2009 model year, one year after the same standards apply in California. We believe a requirement to extend the California standards nationwide after a one-year delay allows manufacturers adequate time to incorporate catalysts across the product lines as they are doing in California. Once the technology is developed for use in California, it would be available for use nationwide soon thereafter." NESCAUM requested that the exhaust emission standards for land-based small SI engines be fully implemented, beginning with the 2009 model year, consistent with the proposed compliance dates for SD/I engine standards.

Wisconsin DNR commented that EPA should accelerate the implementation dates of the exhaust emission standards for Class I and Class II small spark-ignition engines consistent with those adopted by CARB.

NJ DEP noted that the CARB standards for exhaust emissions are fully phased-in between 2005 and 2008, whereas the proposed phase-in dates for the corresponding federal standards do not begin until 2010. Of most concern, NJ DEP highlighted the special provisions for small and medium manufacturers which may delay full compliance until 2014. In light of the fact that manufacturers will already be providing cleaner engines and equipment to California and that technology issues will not be a factor, these cleaner engines and equipment should be required to be made available sooner nationwide.

Environmental Defense commented that they object to the much delayed implementation dates for these important standards. EPA's proposed engine exhaust limits for nonhandheld Class I and Class II engines do not go into effect until model year 2012 and 2011 respectively, while California's comparable standards take effect in 2008 and 2009. In justifying the proposed near-term implementation dates for SD/I and OB/PWC standards, EPA relies on the fact that many manufacturers currently design and sell cleaner engines capable of achieving the proposed standards. Environmental Defense agrees with EPA that the availability of cleaner technology weighs in favor of near-term implementation dates since the cost and burden to manufacturers in meeting a more stringent standard is low in this instance. For this reason, they fail to understand why EPA has reached such a different conclusion in setting the implementation dates for the small SI engine exhaust standards. Technological advances in the SI small market, just like those in the SI marine sector, have resulted in the wide-spread availability of cleaner engines capable of achieving greater emissions reductions. In addition, EPA's proposal provides small SI engine manufacturers with substantial flexibility by allowing them to choose from a number of aftertreatment technologies in order meet the new standards. The breadth of available technologies capable of reducing small engine emissions to the proposed Phase 3 levels weighs in favor of shorter implementation dates, not longer. EPA's failure to explain adequately its

basis for delaying the implementation dates by some 4-5 years is arbitrary and capricious and contrary to law.

Mr. Dan Holland commented that he opposes delaying immediate and full implementation of the proposed rules. He believes that requiring water craft to comply with the new standards in 2009 but not require "land-based" small engines to comply until 2011 is arbitrary and capricious. There is no need -- or excuse -- to wait until 2011 to implement the new regulations with respect to all new small engines. He believes that proven technology is commercially available now that can make all new small engines compliant with the more stringent, proposed regulations that the EPA is authorized to promulgate. Delaying implementation of the new standards with respect to new land-based small engines until 2011 can only be interpreted as “political” bias in favor of the Senator from Missouri that has long opposed emissions regulation and emissions reduction on the specious grounds that the addition of catalytic converters etc. cause small engines to run “hot” and/or cause external fires, both of which studies by the EPA and others have disproved. Substantial emissions reductions can readily and easily be achieved by adding existing, proven, inexpensive technologies to new engines, and this wait-until-2011 “free pass” for land-based engines is simply unacceptable, and it is legally indefensible in light of Congress's mandate in section 428(b) of the 2004 Consolidated Appropriations Act and existing Section 213(a)(3) of the Clean Air Act which contemplates an immediate business response during a 12-month business-design cycle, not a business cycle "four years from now."

Letters:

Commenter	Document #
OPEI	0675
MECA	0668
CARB	0682
NACAA	0651
Pennsylvania DEP	0676
MARC AQ Forum	0696
NESCAUM	0641
Wisconsin DNR	0663
NJ DEP	0710
Environmental Defense	0648
D. Holland	0595

Our Response:

EPA continues to believe that the proposed Phase 3 standards are the appropriate standards for nonhandheld engines for the years in which they were proposed. (See Section 2.2.1 for further discussion of the comments on the level of the standard for the Phase 3 nonhandheld engine standards.) As noted above, EPA believes the new Phase 3 standards for nonhandheld engines are technology forcing and are expected to result in the use of technologies including engine improvements, catalysts, and fuel injection to achieve the required emission reductions. Engine manufacturers will need substantial time to redesign all of their engine families to comply with the new standards.

A look at the current certification data for the 2008 model year provides useful information to gauge the level of effort required by engine manufacturers to comply with the new standards. (EPA's certification data can be found on the internet at the following site: http://www.epa.gov/otaq/certdata.htm#smallsi) There are a total of 87 manufacturers with nonhandheld engine families certified with EPA. For the following discussion, we have focused on the 15 manufacturers that historically have been selling in the small engine market. (The remaining 62 manufacturers, primarily from China, are recent participants in the small engine market and generally have only 1 to 5 engine families certified with EPA with relatively low sales volumes.) For these 15 manufacturers of nonhandheld engines, there are currently 66 engine families certified in Class I and 121 engine families certified in Class II. (These numbers exclude engines used exclusively in snowblowers which do not have to comply with the HC+NOx standards). While some of these engine families have emission levels below the Phase 3 standards, manufacturers will need to redesign the bulk of the designs to meet the Phase 3 standards. For these 15 manufacturers, EPA estimates that 53 of the Class I engines and 83 of the Class II engines will have to be redesigned to meet the Phase 3 standards. ("Analysis of 2008 Small SI Nonhandheld Engine Certification Data," EPA memo from Phil Carlson to EPA Docket OAR-2005-0008, August 28, 2008, docket item EPA-HQ-OAR-2004-0008-____.)

For the six manufacturers with the highest numbers of nonhandheld engine families (i.e., Briggs and Stratton, Fuji Heavy Industries, Honda Motor Company, Kawasaki Heavy Industries, Kohler Company, and Tecumseh Products Company), EPA estimates that they will need to redesign over 19 engines families, on average, to comply with the new Phase 3 standards. (The range in the number of engine families needing to be redesigned for these manufacturers is from 12 to 35 engine families.) Given that we are finalizing the Phase 3 standards in late-2008, manufacturers will have only 2 years before the Class II engine standards take effect and 3 years before the Class I engine standards take effect. As described below, we believe that engine redesign will require a significant level of effort for engine manufacturers. Given the level effort needed and the number of engine families needing to be redesigned, EPA does not believe it would be possible to reduce the lead time for the new standards.

The Phase 3 emission standards for Class I engines are expected to result in engine improvements and the use of catalysts. Catalysts have been implemented on few of these engines to date and therefore the expected widespread use will require significant technology development and investment from engine manufacturers. In addition to the catalyst brick formulation, other technology requirements include muffler design for desired pollutant conversion (which they will want to optimize for minimum precious metal loading to reduce costs), consideration of regulatory useful life emission requirements, addressing cooling requirements related to muffler skin temperature and exhaust temperature, and testing of the engines in real-world applications. While EPA believes the technological challenges can be met by manufacturers, each of these steps will take considerable resources and time to address for each of their engine families. As noted in Chapter 6 of the Final RIA (as well as Chapter 6 of the Draft RIA for the proposal), EPA estimates that engine modifications will take 4 months of design work and 6 months of development work for each engine design. In addition, EPA estimates that applying catalysts will take 2 months of design work and 5 months of development work for each engine design.

Likewise, the Phase 3 emission standards for Class II engines are expected to result in both engine redesign and the application of catalysts on many engines. For those Class II engines using catalysts, engine manufacturers will need to address the same issues noted above for Class I engines. In addition, they will need to communicate closely with their Class II engine users (i.e., equipment/vehicle manufacturers) since most Class II engines are sold without an exhaust system. Due to the wide number of exhaust systems used on these engines, equipment manufacturers will either have to modify the existing equipment design to utilize a manufacturer provided muffler, or they will have to develop their own muffler using the engine manufacturer's provided catalyst brick specifications and then do the certification of that engine. Although EPA believes these issues can be addressed, all of these efforts will take time. As noted in Chapter 6 of the Final RIA (as well as Chapter 6 of the Draft RIA for the proposal), EPA estimates that engine modifications will take 4 months of design work and 6 months of development work for each engine design. In addition, EPA estimates that applying catalysts will take 2 months of design work and 5 months of development work for each engine design.

Finally, under the Phase 3 program, EPA is requiring the certification of engines using new test procedures under part 1065 by the 2013 model year. These new procedures require engine manufacturers to implement changes to their current test setup in order to incorporate new test cell operation procedures and new emissions calculations. If a manufacturer is going to spend the resources to certify a new engine, they will likely want to do it only once so as to use the carryover data option in certification for a number of years. Therefore, it is likely manufacturers will want to certify in 2011 or 2012 with the new procedures. The effort it will take to convert manufacturer's facilities depends on the age of the manufacturer's current testing equipment and will add to the time and effort required to comply with the new Phase 3 standards.

Given the number of engine families that need to be redesigned, the types of technological issues that will need to be addressed for each engine family, and the new test procedure requirements to which manufacturers will need to convert, EPA believes the 2012 requirement for Class I and 2011 requirement for Class II are the appropriate leadtime for the new standards.

With regard to the comments that EPA should move up the implementation dates because California's Tier 3 standards are already in effect, an analysis of the 2008 model year certification data from CARB for the six engine manufacturers with the highest number of nonhandheld engine families (as noted above) provides some useful information. While CARB's Tier 3 standard for Class I engines took effect in 2007, only 9 out of 29 engine families are certified by these manufacturers at or below the 10.0 g/kW-hr HC+NOx standard. For Class II engines, where the Tier 3 standard takes effect in 2008, only 19 out of 60 engine families are certified by these manufacturers at or below the 8.0 g/kW-hr HC+NOx standard. While these manufacturers have redesigned some of their engines to meet CARB's Tier 3 standards, they are using emission credits to certify the remaining engines. Therefore, even though CARB's Tier 3 standards are already in effect, manufacturers have a significant amount of work to finish certifying their engines for California. We continue to believe the Phase 3 implementation dates of 2012 for Class I and 2011 for Class II provide the appropriate leadtime for manufacturers to redesign their engines to comply with EPA's Phase 3 standards.

2.2.3 CO standard for marine generators

What Commenters Said:

MECA supported EPA's proposal to establish a Phase 3 CO standard of 5 g/kW-hr for marine generators. They noted that existing commercial applications of catalyst-equipped marine generators provide strong evidence that EPA's proposed low CO standard for marine generators is technically feasible.

EMA commented that dedicated marine generator engines that are permanently installed into vessels (such that they can take advantage of features such as water cooling, vessel DC electrical systems, electronic closed loop feedback fuel control systems, and three way catalyst aftertreatment systems) may be able to comply with the proposed CO emission standard (5 g/kW-hr). However, many auxiliary marine engines are either not dedicated to the vessel or are not integrated in a manner consistent with the technology that would be required in order to achieve the proposed CO emission level. Accordingly, EMA commented that the final regulation must clarify that the proposed CO standard is only applicable to the fully-integrated marine generator engines described in the NPRM.

Letters:

Commenter	Document #
MECA	0668
EMA	0691

Our Response:

We agree with EMA that marine auxiliary engines that are not generators should not be subject to the more stringent CO standard. This was reflected in the proposed rule. We do not believe it is appropriate to specify some degree of integration for marine generators before the more stringent standards apply. This information is generally not available to engine manufacturers at the point of certification and it would be difficult to specify an objective measure that would make this enforceable. The final regulation is unchanged, requiring all marine generators to meet the 5 g/kW-hr CO standard.

2.2.4 Useful life

What Commenters Said:

EMA noted that there are a wide variety of usage patterns for the engines and equipment governed by the proposed regulation. EMA commented that the proposed maximum time span of 5 years for the emission durability period is acceptable provided that the final rule clearly states that the durability period is the lesser of either hours or years.

OPEI commented that the last line of the useful life definition, "If an engine has no hour meter, the specified number of hours does not limit the period during which an engine is required

to comply with emission standards…" should be deleted. OPEI supported a 5 year time limit on useful life. This means the specified number of hours or 5 years (whichever comes first).

CARB believes that it is appropriate to limit the useful life period to five years or the specified number of operating hours, whichever comes first. Limiting the useful life period would be favorable to both industry and regulatory agencies. It would allow manufacturers to limit warranty coverage by a time period rather than operating hours which can be difficult to determine. For regulatory agencies, it provides more flexibility in limiting the length of time credits may be used.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
EMA	0691

Our Response:

All the commenters supported the provision that would define the useful life period as five years or a specified number of hours of engine operation, whichever occurs first. We are therefore adopting this provision, including a clear statement that either one of these two age indicators would be sufficient to establish the end of the useful life.

The last sentence in the definition of useful life clarifies how to apply the definition with respect to hours of operation if the engine has no hour meter. Leaving out this specification would leave this ambiguous and would require that we make a judgment in guidance to the industry. We believe it is therefore fitting to include this clarification in the regulation. Moreover, we believe the proposed provision establishes a very reasonable approach, such that the hours-based limit on useful life is meaningful only if the extent of operation can be established without the missing hour meter. For example, if an engine is certified based on a useful life of 250 hours, we would intend to be able to do in-use testing on such engines that have been in service in consumer use in a riding lawnmower throughout the five-year period representing the useful life, unless it is clear that the engine has operated for more than 250 hours (if, for example, the lawnmower has been used in commercial service long enough to demonstrate that it has operated longer than 250 hours.

See Section 2.4.2 for additional discussion related to selection of useful life values for certification.

2.2.5 Crankcase controls

What Commenters Said:

EMA commented on §1054.115(a)(1)(i) "What other requirements apply?" EMA noted that the section states that engines must be manufactured in a way to allow crankcase emissions

to be routed into the emission measurement sampling system. EMA commented that it is impractical for an engine manufacturer to meet this requirement given the diversity of exhaust emission measurement equipment. This requirement should be revised to replace the testing requirement with an engineering judgment/test requirement as described in §90.109.

EMA commented on §1054.115(a)(1)(ii) "What other requirements apply?" EMA commented that because the exhaust emission measurements utilized to determine the deterioration factor must include the crankcase emissions pursuant to §1054.115(a)(1), this section's requirement to include deterioration in crankcase emissions in the determination of deterioration factors is illogical. However, if the requirement in §1054.115(a)(1)(i) is revised to incorporate the language from §90.109 (as suggested above), then this section would not require any additional revisions.

Letters:

Commenter	Document #
EMA	0691

Our Response:

It is unclear on what basis manufacturers should be using good engineering judgment regarding an engine's ability to meet emission standards considering vented crankcase emissions if those emissions cannot be measured. We believe emission-measurement systems should be capable of measuring crankcase emissions where a manufacturer would want to make a separate measurement of crankcase emissions for adding to the conventional emission results. This is especially true in the case of dilute testing. However, regardless of the method used to measure emissions, we allow for a test setup in which the engine is modified such that the crankcase emissions are vented into the exhaust before sampling. This should be readily achievable for any system that can make a valid exhaust emission measurement with Small SI engines.

We find it entirely logical to consider measured changes in crankcase emissions over an engine's service life in the determination of deterioration factors. The effect of changing crankcase emissions could be quantified separately (if crankcase emissions are measured separately) or the manufacturer could use a single deterioration factor that combines the crankcase and conventional exhaust emissions at all points.

2.2.6 Safety

What Commenters Said:

OPEI commented that the ability of manufacturers to produce and accurately evaluate the potential hazards of any new technology, including catalyzed mufflers, depends on EPA providing adequate lead-time and all the related proposed flexibilities. There will be substantial development work and costs associated with the development and installation of heat-shielding, and other safeguards to ensure that catalyzed exhaust systems (at the efficiency levels discussed in the proposal) do not pose any increased risks or hazards. As EPA's administrative record demonstrates, any more stringent exhaust standards, or more accelerated effective dates (than

those EPA has proposed) would not meet that statutory requirements in Section 213 of the Clean Air Act, including feasibility, safety, lead-time, and costs.

OPEI continued that the industry is becoming much better informed on how to build and evaluate catalyzed products primarily as a result of the continued research and development work internally conducted by manufacturers. Manufacturers are also becoming better informed on the exhaust gas temperatures and the muffler surface temperatures (where grass clippings and other debris could potentially ignite) through the comprehensive study that was released this spring by the National Institute of Standards and Technology (NIST). Manufacturers will become more knowledgeable through the current related study on the heat-related challenges of catalyzed mufflers that has been conducted by the SP Technical Research Institute of Sweden for the International Consortium for Fire, Safety, Health and the Environment (ICFSHE). The OPEI Education and Research Foundation funded both the NIST and SP studies in order to promote our understanding of the heat-related challenges with both catalyzed and non-catalyzed mufflers so that manufacturers can build even safer products that respond to these challenges. From OPEI's perspective, the NIST and SP studies are solely intended to inform manufacturers as they develop new ANSI standards for "Mitigation Of Heat-Related Hazards From Mufflers On All Ground-Supported Equipment". For example, the SP study will ultimately help manufacturers develop procedures (to mimic in their laboratories) the most challenging and complex off-nominal conditions (such as single spark-plug misfire or malfunction on a twin cylinder engine). The EPA and SP studies (as well as manufacturers' current experience in California) also generally confirm the enormous challenges and lead-time needed to design, build and internally evaluate all their diverse catalyzed equipment to ensure these products will be durable, emission-compliant and minimize the risks under the complex, nominal and off-nominal operating conditions.

OPEI commented that while there is still much work that remains to be done, OPEI members are working with all their different suppliers to develop catalyzed products and to draft and finalize the new, helpful ANSI standards. The smaller OEMs (with the least internal staff and resources) will benefit the most from the information supplied in the ANSI process. ANSI standards development is a voluntary consensus-based process. The actual time to develop a standard varies based upon the iterative notice and comment procedures. The ANSI committee is currently on track to develop the final ANSI standards before the Phase 3-exhaust standards are proposed to become effective in 2011.

OPEI stated that EPA's proposed exhaust standards combined with the proposed effective dates should allow time for the entire industry to build catalyzed products that do not increase any risks. The proposed effective dates should allow time for the new ANSI standards to be finalized and issued to the public before the Phase 3 exhaust standards begin to apply.

MECA concurred with the conclusions reached by EPA staff that the application of catalysts to nonroad equipment or marine generators with either Class I or Class II spark-ignited engines can be accomplished using available engineering exhaust system design principles in a manner that does not increase the safety risk relative to today's uncontrolled equipment. In particular, the EPA safety study on non-handheld equipment equipped with catalyzed mufflers represents the most thorough safety study completed to date on this class of spark-ignited

engines. The results of this EPA study showed that properly designed catalyzed mufflers pose no incremental increase in safety risk (and in many cases even lower muffler surface temperatures) relative to currently available non-handheld equipment sold without catalysts. Catalysts have also been used voluntarily on lawn mowers in certain European markets since the late 1990s and on a range of handheld equipment with no significant, reported safety issues, providing additional support that catalysts can be integrated into the mufflers of Class I and Class II engines in a safe manner.

During testimony at the public hearing, Mr. Richter of Heraeus noted that they have supplied catalysts for European "green" products in response to certain European states that have requirements for catalyst-based systems on some of their walk behind equipment. Mr. Richter noted that nearly a million walk behind mowers have been produced with a catalyst in Europe in response to these requirements. When asked if he was aware of any problems, performance issues or anything related to use of the catalysts, Mr. Richer responded that there were none whatsoever.

Letters:

Commenter	Document #
OPEI	0675
MECA	0668
Heraeus (hearing)	0642

Our Response:

Section 213 of the Clean Air Act directs us to consider the potential impacts on safety, noise, and energy when establishing the feasibility of emission standards for nonroad engines. Furthermore, section 205 of EPA's 2006 Appropriations Act requires us to assess potential safety issues, including the risk of fire and burn to consumers in use, associated with the new emission standards for nonroad spark-ignition engines below 50 horsepower. We expect that the new exhaust and evaporative emission standards will have no adverse affect on safety.

In response to industry comment that proposed exhaust standards combined with the proposed effective dates should allow time for the entire industry to build catalyzed products that do not increase any risks, we are finalizing the proposed standards in the years in which they were proposed. Given that we are finalizing the Phase 3 standards in mid-2008, manufacturers will have a little over two years to redesign their Class II engines and a little over three years to redesign their Class I engines.

The safety analysis performed by EPA for Class I and II engines and SP Technical Research Institute for Class II engines both indicate that the addition of catalyst technology can be safely implemented with the proper design strategies. Both of these studies are available in the docket. ("EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower," EPA420-R-06-006, March 2006, docket item EPA-HQ-OAR-2004-0008-0333.) ("Scientific Evaluation of the Risk Associated with Heightened Environmental Requirements on Outdoor Power Equipment - Phase II," SP Technical Research Institute of Sweden, docket item EPA-HQ-OAR-2004-0008-711.1.) In addition, a detailed

analysis of both studies is included in a Memo to Docket EPA-HQ-OAR-2004-0008 titled "Nonhandheld SI Exhaust System Safety Analysis."

The scope of our safety study included Class I and Class II engine systems that are used in residential walk-behind and ride-on lawn mower applications, respectively. We conducted the technical study of the incremental risk on several fronts. First, working with CPSC, we evaluated their reports and databases and other outside sources to identify in-use situations that create fire or burn risk for consumers. From this information, we identified ten scenarios for evaluation covering a comprehensive variety of in-use conditions or circumstances that could lead to an increased risk of fire or burn. Second, we conducted extensive laboratory and field testing of both current technology (Phase 2) and prototype catalyst-equipped advanced-technology engines and equipment (Phase 3) to assess the emission control performance and thermal characteristics of the engines and equipment. Third, we conducted a design and process Failure Mode and Effects Analyses (FMEA) comparing current Phase 2 and Phase 3 compliant engines and equipment to evaluate incremental changes in risk probability as a way of evaluating the incremental risk of upgrading Phase 2 engines to meet Phase 3 emission standards.

Our technical work and subsequent analysis of all the data and information strongly indicate that effective catalyst-based standards can be implemented without an incremental increase in the risk of fire or burn to the consumer either during or after using the equipment.

2.2.7 Altitude

What Commenters Said:

OPEI recognized that altitude provisions for handheld engines are controlled by §1054.145(c)(4). This paragraph specifies that handheld engines must meet applicable emission requirements up to an altitude of 1100 feet (96 kPa). Kit information should be supplied in the operator's manual and application for certification. Handheld engines are small, compact and also cannot bear the cost of automatic altitude compensation systems. Such engines also run under high thermal and mechanical load, which make them sensitive to increased air-fuel ratio that would follow having to comply with the emissions standard also at high altitude settings. In general, A/F ratio changes as a function of the square root of the air density/fuel density. This may vary based on unique engine characteristics. Depending on a manufacturer's compliance margin and production line auditing values, OPEI believes the 1100-foot (96 kPa) requirement should be acceptable.

OPEI supported the proposed requirement that altitude kits must be available for non-handheld products sold in geographic locations with higher altitudes. They believe the prescribed ambient pressure limitation for determination of compliance is acceptable and more appropriate than the referenced altitude. The manufacturer's ability to demonstrate compliance with the prescribed exhaust emission standard levels at atmospheric pressures lower than 94.0 kPa should utilize a combination of historical information, engineering analysis, and good engineering judgment in the determination of altitude kit information to be included in the engine family certification application and owner's manual. OPEI commented that the regulatory requirements should be minimized in order to continue to allow the various manufacturer processes that have and will continue to provide this service to their respective customers.

EMA supported the proposed requirement that altitude kits must be available for products sold in geographic locations with higher altitudes. The prescribed ambient pressure limitation for determination of compliance is acceptable, and a more appropriate metric than using actual altitude. However, EMA commented that the manufacturer should be allowed to demonstrate compliance with the prescribed exhaust emission standard levels at atmospheric pressures lower than 94.0 kPa utilizing altitude kit information included in the engine family certification application and owner's manual. Altitude kit design should be determined using a combination of historical information, engineering analysis, and good engineering judgment. EPA should minimize the regulatory requirements in order to continue to allow the various manufacturer processes that have and will continue to provide this service to their respective customers.

EMA noted that engine manufacturers can (and do) provide the necessary parts and training for modification of products that are used in high-altitude conditions. Customers that operate equipment in high-altitude areas are well aware of the need for these modifications. In order for these provisions to be viable, EPA must allow a means for the manufacturer to provide these altitude kits to consumers (dealer network, distribution system, etc.). However, EMA believes that the owner's manual information should be limited to altitude effects that owners will understand. Specifically, the owner's manual should include information that would inform the consumer that engines operated at altitudes greater than the manufacturer prescribed minimum may require the engine/equipment to be modified in order to ensure proper operation. The owner's manual also should instruct the consumer to contact the engine manufacturer for further information. In addition, the information provided to the ultimate customer must identify the range of altitude the product is expected to operate in, the applicable engine specifics required to determine the appropriate altitude kit, and where the customer can either obtain the required kit or have the kit installed.

EMA commented on §1054.115(c) "What other requirements apply?" EMA commented that the reference to 40 CFR Part 1065.520 should clarify that the specified barometric pressure range of 94.0 to 103.325 kPa is an exception rather than an additional requirement. Further, EMA commented that the meaning of the reference to a "standard configuration" is unclear. Accordingly, the language should be revised to read as follows: "Engines must meet the applicable emission standards for valid tests conducted under the ambient conditions specified in 40 CFR Part 1065.520 except using a barometric pressure range from 94.0 to 103.325 kPa. This requirement is applicable to nonhandheld engines distributed to all areas that do not exceed 2000 feet in elevation above sea level. See §1054.145(c) for handheld engine provisions. For higher altitude distribution, and resulting lower barometric pressures, carburetor modifications by the use of altitude kits is acceptable provided that these kits are specified in the certification application and information is provided to the customer that identifies the altitude kit requirements."

EMA commented on §1054.501(b)(3) "How do I run a valid emission test?" EMA noted this section directs the manufacturer to perform testing under the ambient conditions specified in 40 CFR Part 1065.520, however, the ambient pressure range specified in §1065.520 is a range from 80.0-103.325 kPa and the pressure range specified in §1054.115(c) is 94.0-103.325 kPa. Therefore, EMA commented that §1054.501(b)(3) should be revised to reflect the pressure range

applicable to Small SI engines pursuant to §1054.115(c) and the reference to §1065.520 should be deleted.

EMA commented on §1054.205(r) "What must I include in my application?" EMA commented that this section should be revised to clarify what information must be submitted in the certification application, and what information must be made available to consumers. Engine manufacturers routinely utilize engineering analysis to determine the altitude kit requirements which are correlated to engine function performance at different altitudes. However, the engine manufacturer does not have the ability to directly confirm emission compliance. EMA commented that this section should be revised so that it is clear that while the information provided to the engine owner must be accurate, it also should be easy to understand and not overly technical. Specifically, the information required to be provided to the engine owner should either enable the engine owner to determine whether or not an altitude kit is appropriate and necessary for their operating location or provide contact information for a resource that can assist with such determination.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691

Our Response:

The altitude-related requirements appropriately specify that emission standards apply for nonhandheld engines throughout the range of atmospheric pressures identified in §1065.520, specifically from 80 to 103.325 kPa. We are adopting special testing and compliance provisions related to altitude. We are requiring that nonhandheld engines meet emission standards without an altitude kit, but will allow, in certain cases, testing at barometric pressures below 94.0 kPa (which is roughly equivalent to an elevation of 2,000 feet above sea level) using an altitude kit. (An altitude kit may be as simple as a single replacement part for the carburetor that allows a greater volumetric flow of air into the carburetor to make the engine operate as it would at low altitudes.) Such kits were allowed under part 90 and we are keeping the provisions that already apply in part 90 related to descriptions of these altitude kits in the application for certification. This includes a description of how engines comply with emission standards at varying atmospheric pressures, a description of the altitude kits, and the associated part numbers. We agree that §1054.501 should reference the pressure-related provisions in §1054.115, but do not agree that the reference to §1065.520 should be deleted.

OPEI's comments generally supported the proposed standards and related requirements for complying with the regulations based on operation at high altitude. The requirement for nonhandheld engines to meet standards up to 94.0 kPa without an altitude kit and for manufacturers to specify the need for altitude kits to continue to comply with emission standards at lower pressures (or higher altitudes) fits with the recommendations spelled out in the comments. Also, EMA's description of an approach to including altitude-related information in the owner's manual is an excellent summary of what we would hope to see. The regulations are

somewhat less descriptive than EMA describes, but we would have no objection if manufacturers include the additional information suggested in the comment.

We believe the proposed provisions requiring manufacturers to describe altitude-related information in the application for certification are clear. The regulations in §1054.205 specify simply that manufacturers must describe their plan for making information and parts available such that they would reasonably expect kits to be widely used in high-altitude areas. The example noted includes a very basic expectation that owners should have ready access to information describing when an altitude kit is needed and how to obtain this service. The detailed description included in EMA's comments would be a satisfactory approach to meet these requirements.

One thing engine manufacturers could consider adding in their communication to owners would be geographic-based information. For example, we identify in the regulation those counties with median altitudes greater than 4000 feet above sea level. Owner's manuals or websites could include specific information to identify those areas as needing altitude kits for proper engine operation, if applicable.

2.3 Averaging, banking, and trading

2.3.1 Use of Phase 2 credits (and early Phase 3 credits)

What Commenters Said:

EMA noted that the implementation of Phase 3 exhaust emission standards clearly will play an important role in the continued improvement of the environment. Early introduction of clean technology that would further benefit the environment should be encouraged, and manufacturers should be afforded meaningful incentives for the early introduction of these cleaner Phase 3 products. It is imperative that EPA recognize that the ability of manufacturers to comply with the Phase 3 program is tied to their ability to use existing Phase 2 credits and the creation of transitional and enduring Phase 3 credits from the early introduction of Phase 3 product. Engine manufacturers that have either provided a historical benefit or are eager to provide additional environmental benefit through either early compliance or the introduction of over achieving nonhandheld engines should be encouraged to do so. EMA recommended a number of changes to the NPRM in order to ensure the success of this important program. OPEI also recommended the same changes in their comments.

First, EMA and OPEI commented that the requirement that both Phase 3 transition credits and Phase 3 enduring credits must be used prior to using Phase 2 credits should be revised. Engines that are introduced early and produce Phase 3 enduring credits are providing a substantial environmental benefit that should be encouraged. As proposed, there is no incentive for manufacturers to certify engines to FEL levels below the Phase 3 standard level because EPA would require the resulting enduring credits to be used prior to Phase 2 credits. Said another way, one of the costs to the manufacturer in investing in engines certified below the Phase 3 level is the likely loss of Phase 2 credits. That is unfair, and makes no sense. As a practical matter, certifying below the Phase 3 level prior to expiration of Phase 2 credits would have no benefit to the manufacturer as currently proposed. Accordingly, in order to promote and

encourage the early introduction of Phase 3 and over-achieving nonhandheld products into the marketplace as soon as possible, engine manufacturers must be allowed to preserve the Phase 3 enduring credits that they have the capability of generating (see §1054.740(c)).

Second, EMA and OPEI commented that at the present time, the proposed AB&T program creates substantial concern and potential exposure to engine manufacturers because of their inability, despite their intentions, to be able to plan for such unforeseen factors as weather and customer demand. When that uncertainty is coupled with the proposed combined limitations on the use of Phase 2 and Phase 3 credits, manufacturers' ability to ensure compliance is jeopardized. In order to prevent such unintended consequences, manufacturers should be allowed to utilize Phase 2 credit banks discounted by 20% per year or, in the alternative, if no Phase 2 credits exist, to carry a negative credit balance for up to two model years. The option for a manufacturer to maintain a negative credit balance would be at EPA's discretion, based on the manufacturer's ability to provide information demonstrating that any negative credit balances would be eliminated no later than the 2016 model year. In addition, EMA and OPEI envision that EPA would not allow a negative credit balance situation based on planned engine family FEL and volume projections, but only on unexpected volume adjustments occurring within an averaging set or the need to make an unanticipated upward adjustment to FEL due to an insufficient compliance margin, as determined from production line testing (see §1054.740).

Finally, EMA and OPEI commented that engine manufacturers which have provided a benefit to the environment through the early introduction of Phase 3 credit generating nonhandheld engines should not be penalized regarding the use of those credits for the continued certification of their handheld engine families. Handheld engine families will continue to comply with the same exhaust emission standards under the proposed Phase 3 standards as the current Phase 2 engine families. A requirement for these carry-over handheld engine families to utilize Phase 3 nonhandheld generated credits is inappropriate and should not be included in the final rule. OPEI commented that these specific handheld families should be allowed to continue to use Phase 2 credits under the provisions EPA has outlined.

CARB commented that in general it supports restrictions on credit generation and use to ensure that emissions benefits represented by the credits are accounted for properly. CARB commented that it would like to strongly discourage the concept of carrying an emission credit deficit. Manufacturers have sufficient time to plan for the change to new engines and they have the option to make the changes earlier than the deadline. If however, U.S. EPA chooses to allow the use of credit deficits, CARB would strongly encourage a stiff penalty to be added to the deficit as well as a set time limit as to the length of time the deficit may be carried.

CARB also commented that EPA should allow only Phase 3 nonhandheld engine credits to be used under the handheld engine credit provisions after 2013. They believe that prohibiting the use of Phase 2 nonhandheld engine credits for demonstrating compliance with the Phase 3 nonhandheld engine standards after 2013 is reasonable.

Letters:

Commenter	Document #
EMA	0691
OPEI	0675
CARB	0682

Our Response:

EPA believes ABT programs are an important element in setting emission standards that are appropriate under Clean Air Act section 213(a) with regard to technological feasibility, lead time, and cost, given the variety of engines covered by the small SI standards. Depending on their design, ABT programs can create an incentive for the early introduction of new technology, allowing certain engine families to act as trailblazers for new technology. This can help provide valuable information to manufacturers on the technology before they apply the technology throughout their product line. Early introduction of such engines can also secure earlier emission benefits. Thus, EPA believes it is beneficial to design ABT programs to encourage use of the ABT program, especially provisions that encourage the early introduction of new technologies.

EPA agrees that the proposed provisions requiring manufacturers to use their enduring Phase 3 credits before being allowed to use their Phase 2 credits allowance does not encourage the early introduction of Phase 3 engines during the Phase 2 timeframe. In order to encourage the introduction of Phase 3 compliant engines prior to implementation of the Phase 3 standards, EPA is eliminating the proposed provision that would require a manufacturer to use their enduring Phase 3 credits before using their Phase 2 credit allowance. Therefore, under the Phase 3 ABT program, engine manufacturers will be required to use their Phase 3 transitional credits first. If their Phase 3 transitional credit pool is not sufficient, the manufacturer will be able to use their Phase 2 credit allowance second. Should that still not be sufficient, then the manufacturer will be allowed to use their Phase 3 enduring credits last of all to demonstrate compliance.

With regard to the comments on credit deficits, EPA does not believe such provisions are necessary for the Phase 3 program. Given the amount of lead time before the new standards are scheduled to take effect and the provisions allowing use of limited Phase 2 credits, EPA believes manufacturers should be able to monitor their production levels and establish conservative FEL values (especially during the introduction of new engine families) to avoid situations where a deficit situation occurs. While EPA understands that manufacturers could find themselves in a situation where sales volume adjustments occur within an averaging set or an FEL needs to adjusted upward, EPA believes that such changes should be relatively small and within the manufacturers control to a great degree. Manufacturers participating in the ABT program would need to take these potential outcomes into consideration when making plans for complying with the Phase 3 standards through the use of the ABT program.

Finally, in response to the comments on requiring manufacturers to use only Phase 3 nonhandheld credits for handheld engines, EPA is not adopting such a requirement in the final rule. Under the Phase 3 program, in which we are not changing the Phase 2 exhaust standards for handheld engines, manufacturers of handheld engines will be allowed to use credits from

Phase 2 handheld engines for their Phase 3 handheld engines without any restriction. Therefore, EPA believes it can allow manufacturers to use Phase 2 credits from nonhandheld engines to offset their high-emitting handheld engines under the constraints specified in the rule. (As noted in Section 2.3.2, EPA is adding an annual sales limit of 30,000 handheld engines for which a manufacturer can use nonhandheld engine credits.)

2.3.2 Averaging sets and other restrictions

What Commenters Said:

EMA commented that the restrictions regarding cross-class trading of credits is appropriate during the introductory period when unrestricted trading could effect standard implementation, use of Phase 2 credits, and other factors. However, those restrictions should be removed beginning with the 2013 model year. Therefore, EPA should clarify that there are no restrictions for nonhandheld credit trading beginning with the 2013 model year (see §1054.740(d)).

Honda commented that EPA should allow averaging, banking and trading (ABT) of credits across all engine categories, including handheld and nonhandheld engines. The proposed rule uses a stepped form of dividing engines and their respective emission levels into three categories, 0 to 80cc, 80 to 225cc, and above 225cc, and allows averaging and banking only within these separate categories. The inability to average and bank credits inherently applies more significant technical and economic challenges for engines of smaller displacements, within their class, to comply with the specific standard. The ability to supply engines in all displacement and horsepower categories is enhanced by the ability to "smooth" through averaging, exhaust standard steps in a way that resembles the feasible horsepower/displacement curve function. Honda understands that the proposed rule limits the use of existing Phase 2 credits in order to "pull-ahead" the effective implementation of the regulatory standards. However, Honda believes that treatment of Phase 3 credits, including early Phase 3 credits, should be independent of the Phase 2 credits and commented that EPA should consider allowing averaging, banking and trading across Phase 3 categories, in the same manner allowed in Phase 2.

Honda commented that EPA should clarify in the final rule when and if an engine less than 80cc would be categorized as nonhandheld for ABT purposes if EPA does not allow Phase 3 cross class averaging. Clarification or added guidance in the final rule would be useful where an engine less than 80cc is used in a nonhandheld product would qualify as nonhandheld for purposes of ABT, such as an engine used in a ground-supported mini-tiller.

Letters:

Commenter	Document #
EMA	0691
Honda	0705

Our Response:

With regard to the comment on cross-class trading of nonhandheld credits within the nonhandheld engine classes, EPA proposed to allow such trading starting in model year 2013. EPA has added language to specifically state that this is allowed in §1054.740 of the regulations.

EPA believes the proposed restrictions on credit exchanges between handheld and nonhandheld engines in the Phase 3 ABT program should be retained in the final rule (with the limited exception as noted below). While EPA is adopting more stringent exhaust standards for nonhandheld engines in this rule, EPA is not revising the Phase 2 exhaust standards for handheld engines. While most manufacturers tend to be in either the handheld engine market or the nonhandheld engine market, there are a few manufacturers that have a mix of engines falling into both categories. Under the Phase 2 program, where EPA allowed unrestricted averaging across both handheld and nonhandheld engine categories, some manufacturers were able to use credits from one category to delay introduction of cleaner technology engines in the other category. This gave these manufacturers a potential advantage in the market compared to other engine manufacturers that implemented the new technologies and did not have the ability to average with engines in the other category. EPA does not believe an ABT program should encourage such situations in the market. For this reason, EPA is retaining the averaging set restrictions for the Phase 3 rule which prevents averaging of emissions between handheld and nonhandheld engines (except as noted below).

EPA is adopting the proposed provisions which allow manufacturers to use nonhandheld engine credits for handheld engines if the engine family was certified in 2008 based on carryover emissions data and the FEL does not increase above the level selected for the 2007 model year. Based on current certification data, only a small number of engine manufacturers would be impacted by these provisions and the number of handheld engines potentially affected is very small, with overall sales being less than 1 percent of handheld engine sales. However, because of concerns that manufacturers could increase their sales of such high FEL handheld engines, EPA is adopting one additional constraint. Under the final regulations, manufacturers may use nonhandheld credits for up to 30,000 handheld engines per year. EPA believes that the constraints being adopted regarding the use of nonhandheld engine credits for handheld engines should ensure that the sales of these handheld engines remain at their currently low levels.

In regard to the comments on which engines certified to the handheld engine standards can generate nonhandheld engine credits, EPA proposed to allow manufacturers to generate nonhandheld ABT credits from engines below 80cc for those engines a manufacturer has determined are used in nonhandheld applications. EPA is retaining that provision in the final rule. Therefore, a manufacturer can generate nonhandheld engine credits from engines at or below 80cc that are subject to the handheld engine standards if the manufacturer determines they are used in nonhandheld applications (i.e., applications that do not meet the handheld definition in §1054.801 of the regulations). Because the engines are subject to the handheld engine standards, the credits would be generated against the applicable handheld engine standard. These nonhandheld credits could be used within the Class I and Class II engine classes to demonstrate compliance with the Phase 3 exhaust standards, subject to applicable restrictions. Given the restriction on mixing credits between handheld and nonhandheld engines, credits

generated by engines at or below 80cc used in handheld applications could only be used for handheld engines.

2.3.3 FEL caps

What Commenters Said:

EMA supported the proposal that FEL caps should be established at the Phase 2 standard levels. EMA commented that the engine families previously considered Class I-B under the Phase 2 regulation and that are set to become Class I engines under the proposal must be allowed to utilize the prior Class I-B standard level at the FEL cap as those engines were not subject to the Phase 2 Class I standard levels.

Letters:

Commenter	Document #
EMA	0691

Our Response:

EPA agrees with the comment that FEL caps should be established at the Phase 2 standard levels. The final rule includes such a requirement in §1054.103(b) by stating that a manufacturer may not specify a family emission limit that exceeds the applicable Phase 2 standards as specified in 40 CFR 90.103 and summarized in Appendix I of Part 1054.

2.3.4 Credit life

What Commenters Said:

Both EMA and OPEI commented that they oppose the proposition that any engine-exhaust or evaporative credits generated by a manufacturer should have an arbitrary life period. Emission credits are either generated through the voluntary early implementation of new emission control technology or introduction of products that are cleaner than required by the applicable emission standard. Such credits are generated at a cost to the manufacturer, and are granted in exchange for the manufacturer's independent decision to produce products that provide additional benefits to the environment. These credits are important assets that should not be arbitrarily lost due to time or actions not under the manufacturer's control.

CARB commented that it strongly urges EPA to limit the credit life of exhaust credits earned to five years. They commented that emission credits should not outlast the equipment which allowed the manufacturer to attain the credits. CARB also commented that a five year limit on the credit lifetime would also be consistent with the proposed useful life requirements under which the engine manufacturers would be required to warrant the engine for five years.

Briggs & Stratton commented that it opposes any limitation on the life of ABT credits. Engine manufacturers should not be punished for not using the credits in an arbitrary time frame. Briggs and Stratton also commented that the proposed ABT provisions almost completely eliminate the Phase 2 emission credits that have been generated by small engine manufacturers. Engine manufacturers in good faith generated Phase 2 credits under the current regulations. The proposal by EPA is a significant loss to the engine manufacturers.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691
CARB	0682
Briggs and Stratton	0657

Our Response:

We are retaining the unlimited lifetime for Phase 3 ABT credits, as proposed. While EPA is retaining the unlimited lifetime, EPA notes that manufacturers should not assume that Phase 3 credits will be available without any restrictions on their use if, and when, EPA should consider a new round of emission standards in the future. In setting new emission standards, section 213(a) requires of the CAA requires EPA to set emission standards that achieve the greatest degree of emission reduction achievable through the application of technology which EPA determines will be available for the engines or vehicles to which such standards apply, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated with the application of such technology. If manufacturers have a large pool of ABT credits available to them, EPA must consider ways to ensure that those credits do not result in an unnecessary delay of the standards. This can be done in a variety of ways, and has been done in the Phase 3 final rule by allowing only limited numbers of Phase 2 credits to be used for a limited period of time during the transition to the new Phase 3 standards.

EPA does not believe a limit on the life of Phase 3 credits is needed at this time for the ABT program adopted with today's program. Phase 3 credits will be generated at a cost to manufacturers and thus they will have a value to the manufacturers. EPA believes provisions which limit a manufacturer's ability to use credits during the Phase 3 timeframe, such as a limit on credit life, will reduce the incentive for manufacturers to invest in the development and introduction of new technology. However, as mentioned above, manufacturers should not assume that an unlimited life for Phase 3 credits means those credits will be available without any restrictions on their use if, and when, EPA should consider a new round of emission standards in the future. As part of any future rulemaking, EPA would expect to consider ways to ensure that the Phase3 credits existing at that time would not result in an unnecessary delay of any future standards.

With regard to the comment on the loss of Phase 2 credits, EPA does not believe manufacturers have a right to use those credits indefinitely. In fact, EPA would like to point out that such a scenario was clearly a possibility and was noted in the Summary and Analysis of

Comments document for the Phase 2 nonhandheld rule. ("Summary and Analysis of Comments, Phase 2 Emission Standards for New Nonroad Spark-Ignition Nonhandheld Engines At or Below 19 kW," March 3, 1999, docket item EPA-HQ-OAR-2004-0008-____.) In response to comments on the unlimited lifetime of Phase 2 ABT credits, EPA stated that while it was adopting an unlimited credit lifetime for Phase 2 ABT credits at the time, EPA did not wish to limit its ability to address possible unforeseen conditions that arise as a result of the program in future rulemakings. EPA further stated that it would be able to reconsider the appropriate life of Phase 2 ABT credits in connection with any post-Phase 2 rulemaking.

2.3.5 Other ABT Issues

What Commenters Said:

EMA submitted a number of comments on specific regulatory sections. EMA commented on §1054.105(b) "What exhaust emissions standards must my non-handheld engines meet?" EMA noted that while the proposed AB&T program is restricted to HC+NOx emissions, the NPRM does not expressly state that CO emission standards cannot use AB&T (as previously included in Part 90.201). Because the proposal includes a compliance requirement with the significantly lower CO standard for marine generator engines, EMA commented that the final rule should clarify that AB&T is not applicable to CO emissions.

EMA commented on §1054.715(b) "How do I bank emission credits?" They commented that reserve credits cannot be traded. Therefore, EMA recommends that the reference to "trading" should be deleted from this section. (Also included in Section 4.4.5)

EMA commented on §1054.725(b)(2) "What must I include in my application for certification?" They commented that engine families that generate or use credits at the time of certification should not be required to designate their credit destination or origin within the averaging set. (Also included in Section 4.4.5)

EMA commented on §1054.730(f)(3) "What ABT reports must I send to EPA?" EMA commented that if an error mistakenly increases a manufacturer's balance of emission credits, correction of the errors and recalculation of the balance of emission credits should be undertaken at the manufacturer's discretion. They manufacturer should not be required to correct the errors and recalculate the balance of emission credits as currently proposed. (Also included in Section 4.4.5)

EMA commented on §1054.735(d) "What records must I keep?" EMA commented that the requirement to keep additional records for each engine or piece of equipment including the engine identification number, build date and assembly plant is excessive and beyond the current requirements of 40 CFR Part 90.209. They commented that these additional record keeping requirements either should be deleted or replaced with engine manufacturer records associated with products produced. (Also included in Section 4.4.5)

EMA commented on §1054.735(e) "What records must I keep?" EMA commented that this section appears to be arbitrary and capricious. EPA should not be allowed to require manufacturers to keep additional unspecified records or demand additional information not required by the rule without a proper purpose or for cause. EPA should be required to support any imposition of additional record keeping requirements or demand for additional information

with specific and appropriate reasons. Further, such decisions should not be made unilaterally by EPA, and the manufacturer must have the ability to question any such request and, if necessary, request a formal hearing process. (Also included in Section 4.4.5)

EMA commented on §1054.625(j)(2) "What requirements apply under the Transition Program for Equipment Manufacturers?" EMA commented that the requirement to multiply credits generated by an engine family by 0.9 must be limited to engine families that are actually utilized by equipment manufacturers under the §1054.625 flexibility provisions. In addition, EMA commented that engine manufacturers should have the option to track the correct number of engines that utilize the §1054.625 flexibility provisions and adjust ABT credit calculations based on the actual number of engines.

OPEI commented that the "flex" provisions will not be implemented if excessive regulatory burdens discourage engine manufacturers from participating in that program. OPEI believes an unintended possible outcome of the proposed ABT credit adjustment program is the creation of a disincentive for engine manufacturers to participate in the flexibility program. Such a credit adjustment requirement would be unfair (in terms of lost, banked, credits) and would also be overly burdensome to administer. To OPEI's knowledge, such ABT credit adjustments are not part of EPA's other similar equipment flexibility programs. If such an adjustment program is required, OPEI recommended that the credit adjustment provisions for Delegated Assembly be clearly defined as applicable only to those discrete engine families that utilize the Delegated Assembly provisions and are also participating in the flexibility program pursuant to Section 1054.625(c)(2). There are many circumstances where no Delegated Assembly engines will be utilized for equipment manufacturer flexibility programs and discounting of credits should not occur under any scenario. If a credit adjustment program is required, engine manufacturers must be given the option to participate in the flexibility program pursuant to §1054.625(c)(2).

Letters:

Commenter	Document #
EMA	0691
OPEI	0675

Our Response:

With regard to the comment on CO, the ABT program for small SI engines does not cover CO emissions. EPA agrees that language stating that CO is not part of the ABT program should be included in the Part 1054 regulations. EPA has revised §1054.103 and §1054.105 to include such language.

EPA disagrees with the comment on §1054.715(b) suggesting that reserved credits cannot be traded. The existing Phase 2 ABT regulations in 90.206(b), allow manufacturers to trade current model year credits. Current model year credits are "reserved" credits by definition, because manufacturers do not submit their end-of-year and final reports until after the model year is finished. Therefore, EPA believes it is appropriate to include similar language in the Phase 3 ABT regulations stating that reserved credits can be traded. Therefore, §1054.720 of the regulations states in paragraph (b) that a manufacturer may trade reserved emission credits.

Also, it should be noted that the language of §1054.715, paragraph (b) which was noted by the commenter in their comments has been changed to fix an inconsistency in the regulations. The proposed language stated that a manufacturer's credit projections submitted at the time of certification were considered "reserved credits." This is not the case as "reserved credits" are defined in §1054.701 as credits that have been generated, but not yet verified by EPA. In order to generate credits, the manufacturer must actually build engines, not just project that they will build engines. However, the revised language of 1054.715(b) also allows reserved credits to be traded.

EPA agrees with the comment on §1054.725(b)(2) suggesting that manufacturers not have to designate the credit destination or origin for each of its engine families and has removed that requirement from the regulations. However, for engine families that are projecting to use emission credits (i.e., the engine family has a negative credit balance), EPA believes that a manufacturer should provide information on where they will obtain credits for that engine family. Therefore, at the time of applying for certification, a manufacturer will be required to submit certain information to EPA. For the Phase 3 ABT program, the regulations require manufacturers to provide the FEL for the engine family, and detailed credit calculations for the engine family, as well as where they will obtain credits for their credit using families (i.e., from banked credits, from averaging with other current engine families certified with FELs below the standard, or from trading with other engine manufacturers). EPA does not believe it is necessary to require manufacturers to provide any further information, including a detailed accounting of where they plan to use their credits or if the credits they plan to use are actual or reserved, as proposed.

EPA disagrees with the comment on §1054.730(f)(3) suggesting that a manufacturer be allowed to fix errors in the credit reports at its discretion. If errors are discovered at any time showing that a manufacturer has earned too many credits, then EPA believes a manufacturer should be required to correct the error. The ABT program is meant to ensure that the average emission level of all participating engines meet the applicable standard. An error in the ABT reporting that results in more credits being generated than should be generated could result in the average emission level being above the emission standard even though the original credit calculations did not show such a result. Requiring manufacturers to fix such errors would allow EPA to then address any resulting noncompliance.

In response to the comment on §1054.735(d) that the information a manufacturer is required to keep for ABT is excessive, EPA is making some changes to the regulations. EPA believes the changes will still allow us to have access to important information if needed, especially if a noncompliance situation arises. Under §1054.730 of the final regulations, paragraph (b) requires manufacturers to report a variety of information for engines participating in the ABT program including family designation, FEL, useful life, and the production volumes for each participating family. Under §1054.735, manufacturers will be required to keep a copy of the reports submitted to EPA under §1054.730 along with a record of the identification number for each engine produced. If there are multiple FELs in an engine family, the manufacturer will need to keep records of the identification number associated with each FEL. Manufacturers may identify these numbers as a range. Manufacturers will not be required to list

the build date for each engine produced, nor will they be required to keep information on the assembly plant as originally proposed.

With regard to the comment on §1054.735(e) on the provisions requiring manufacturers to keep or allowing EPA to request additional unspecified records or relevant information, EPA believes such a requirement is allowable and necessary. Section 208 of the Clean Air Act (which applies to nonroad engines under section 213(d) of the Clean Air Act) describes the information collection requirements for manufacturers. Under those requirements, manufacturers must provide information EPA may reasonably require to determine whether manufacturers have acted in compliance with regulations. While EPA has listed the specific information a manufacturer must keep for the Phase 3 ABT program in §1054.735, it is possible in the future that we may identify other information that would be needed to deal with a specific situation. The provisions in paragraph (e) of §1054.735 would allow us to request such information. Of course, EPA would only request such additional information if it were in accordance with the law, such as provided for in section 208 of Clean Air Act. In addition, EPA would only expect manufacturers to keep and provide such information after we have put such a request into effect, either through a rulemaking change or guidance to manufacturers. In response to the comment, EPA has revised the language of §1054.735 paragraph (e) to reflect that EPA will request information if it is in accordance with the law. Finally, in response to the comment on requesting a hearing if a manufacturer believes EPA's request is inappropriate, the proposed regulations allow a manufacturer to request a hearing from EPA under §1054.745, paragraphs (c) and (d). EPA has retained those requirements in the final regulations.

In regard to the comments on §1054.625(j)(2) on adjusting ABT credits for credit-generating engine families that are available under the delegated-assembly provisions, EPA continues to believe it is appropriate to adjust such credits. Rather than imposing a disincentive from participating in the transition program for equipment manufacturers (TPEM) program, the credit adjustment merely accounts for the fact that equipment manufacturers may in many cases legally install a non-catalyzed muffler on an engine that is part of a family whose certification depends on the use of a catalyst. It is true the EPA has not adopted this adjustment for other engine categories, but this is because most other engine categories do not have a TPEM program and none of them allow engine manufacturers to produce these engines without specifically identifying them as exempt TPEM engines. EPA wishes to clarify that the adjustment applies only to engine families that are available under the delegated assembly provision and are also participating in the TPEM program. As noted in the proposal, the proposed credit adjustment factor of 0.9 is intended to represent the maximum estimated usage of the TPEM program across the broad range of equipment manufacturers. However, EPA understands engine manufacturers' concerns that the adjustment may not reflect the actual number of engines that are downgraded for use in the TPEM program. Therefore, for the final rule, EPA is retaining the 0.9 adjustment factor. In addition, EPA is including an option that will allow engine manufacturers to track the final configuration of the engines to determine the actual number of engines that were downgraded for the TPEM program. A manufacturer would need to track sales for <u>all</u> of the equipment manufacturers purchasing the given engine family. The engine manufacturer could use the resulting number of engines that were not downgraded in its calculation of ABT credits for that specific engine family.

2.4 Certification

2.4.1 Changing the FEL mid-year (and printing FELs on labels)

What Commenters Said:

OPEI and EMA disagreed with EPA's negative assessment of FEL changes made during the model year. Currently, engine manufacturers may set their initial FEL levels to a level that they are confident will pass production audits and will not result in compliance concerns (provided compliance with the standard requirements is achieved). If, based on the actual production audit results and subsequent Cum-Sum analysis, the manufacturer determines that the FEL could have been lower from the beginning of the model year (or implementation of a running change), OPEI commented that the manufacturer should be allowed to claim credit for the environmental benefit actually provided. The ability to correct the FEL level also provides the manufacturer with a limited ability to recoup credits under the EPA program that are otherwise available to manufacturers under CARB's PLT credit program.

OPEI agreed that lowering the FEL should have a limit. A manufacturer that has already submitted production line test data for a family should not be allowed to retroactively (even at a point in the 4th quarter that would apply back to the first quarter) lower the FEL later in the model year to a level that would result in a CUM-SUM failure from earlier tests in the model year. This in effect sets a cap on the FEL change.

OPEI and EMA commented that the proposed rule's requirement to include the FEL numerical reference on the engine emission label would prevent the manufacturer from being able to accurately represent (in the CARB PLT credit case) or retroactively change FEL levels. They commented that the final regulation should provide the engine manufacturer the ability to make retroactive FEL adjustments. Also, in order to allow such adjustments, OPEI and EMA believe it is essential that EPA drop the proposed FEL labeling requirement.

OPEI noted that CARB does not require either exhaust or evaporative family emission levels (FELs) to be placed on the emission label. EPA's proposal to add individual evaporative and exhaust family emission levels (FELs) on the label would be inconsistent with CARB, would further confuse consumers, and would be totally impractical for manufacturers. For example, consumers could end up unintentionally buying a product with more horsepower that emitted greater mass emissions because the consumer did not realize the FELs are normalized to a single kilowatt. Such FEL labeling will also facilitate additional local purchase restrictions and use bans in direct violation of Section 209(e) of the Clean Air Act and the related legal precedent on federal pre-emption (as discussed below in Section XIV). For all these reasons, OPEI commented that EPA should drop completely its proposed exhaust and evaporative FEL labeling requirement. (Comment also included in 4.6.1 and 4.6.3)

EMA commented on §1054.701(e) "General provisions." EMA believes the requirement that an FEL can only be adjusted applicable to future production is not appropriate and should be deleted. For example, if a manufacturer determines, based on PLT test results, that the margin

for compliance is inadequate and that credits exist either from the current model year or prior model year banked credits, it should be allowed to increase the FEL for the entire model year.

With regard to FEL changes, CARB commented that it agrees with EPA that any revisions to the FEL should only apply to engines produced after the FEL change. They agree that it would be difficult to test the engines before the FEL change because verifying the engine emissions from previously produced engines would be difficult.

Briggs and Stratton noted that EPA asked for comments on including the FEL on the emission labels. Briggs & Stratton disagrees with this proposal. The addition of the FEL on emission labels provides no benefit to consumers, EPA, or the environment. However, this proposal does impose a significant burden on both the engine manufacturer and the OEM. They noted that supplemental labels are required for many applications where the emission label is obscured in the final product. If the FEL must be printed on the emissions label a new emission label is required whenever the FEL is changed. This creates more costs and labels to manage for the engine manufacturer and the equipment manufacturer with no commensurate benefit to the environment. Briggs and Stratton commented that EPA should delete the requirement for the FEL to be printed on the label.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
Briggs and Stratton	0657
EMA	0691

Our Response:

We maintain two principles that contradict the manufacturers' comments regarding FEL changes and printing FELs on emission labels. First, we believe that each engine a manufacturer produces should be associated with a family emission limit at the point of production. This is important for ensuring proper accountability and enforceability. If manufacturers are able to assign FELs after production with the only restriction being related to compliance with statistical calculations for production-line testing, there is a great concern that it would be very difficult to confirm that FELs were assigned appropriately. Similarly, if accountants change FELs retroactively, it would be very difficult to test engines after they have been placed into service and establish whether it meets emission standards or not. There would seem to be no clear way of knowing which FEL applied to which engine.

Second, the intent of production-line testing and the underlying statistical calculations depend on the engine having a specific and permanent applicable standard (with or without an FEL). The statistical calculations are based on a given number of engines passing or failing the applicable emission standard out of a bigger population representing the complete emission family. Repeating the CumSum calculations after the end of the year has the effect of simulating the engine family as if the tested engines were the complete population. Aside from the bad math, we believe manufacturers should set their FELs with the understanding that they are liable

for the test results as they are generated. Waiting until the end of the year to set the real and final FEL sets up an incentive for the manufacturer to use a high FEL through the year, then simply reduce the FEL at the end of the year as much as the statistics allow. This puts the manufacturer in a position of having almost no liability from production-line testing. In contrast, we believe manufacturers should set the FEL for a family only as low as they can based on the understanding that tested emissions must comply with the named FEL. If manufacturers learn early in the model year that their FEL is higher than it needs to be, they may decrease the FEL as much as can be justified based on prior testing and use that lower FEL for most of the model year to generate larger quantities of credits (or use smaller quantities).

We proposed to require manufacturers to print FELs on emission labels. This is common across our programs and is intended to help us clearly establish the applicable emission standard for each engine. In discussions after the close of the comment period, manufacturers agreed with us that it would be as effective for the manufacturers instead to keep records to correlate engine build dates with changing FELs. For example, if a manufacturer would change the FEL for an engine family for production engines starting June 14 of a given year, it would keep a record of engine identification numbers that would allow them to identify the applicable standard for each engine. If manufacturers choose to identify their build dates by month and year (without the specific date), the presumed build dates would default to least favorable dates for the manufacturer. In the case of an FEL increase on June 14, this means the manufacturer would apply the new FEL starting with engines produced on June 1; conversely, a decreased FEL would apply starting with engines produced on June 30. This flexible approach would allow the manufacturer to forego some emission credits for the advantage of being less careful with tracking engine serial numbers with build dates. This approach for assigning dates for calculating emission credits may be slightly different than the timing associated with the revised certificate that we would issue for the engine family; however, we believe this should not be a problem.

Along with the requirement to keep records of engine build dates with FEL changes, we are adopting a requirement for the manufacturer to report this information in the ABT reports submitted after the end of the model. These engine identification numbers may be submitted as a range of values to streamline the report as much as possible.

2.4.2 Useful life implementation (and labeling)

What Commenters Said:

CARB commented that it agrees with U.S. EPA that a numerical value is the best way to describe the useful life of equipment. If other terminology is used, CARB suggests that both the descriptive terminology and the numerical value should be used. If only one can be used, then CARB suggests that the numerical value representing the useful life be retained.

NESCAUM commented that it supports EPA's proposal to require engines and equipment be labeled in a manner that will help the user better understand the intended useful life of the equipment. They believe using descriptors such as Residential, Premium Residential,

Commercial, and Heavy Commercial will be helpful in this regard, provided that there is a means to match the descriptor against a specified useful life period in terms of operating hours or years.

OPEI commented that it is concerned that a consumer may become confused if only the hours are listed on the label. A 125-hr handheld product is considered "Premium Residential" according to EPA while a 125-hour Class I engine would be classified as "Residential". To avoid this confusion OPEI requested the EPA allow for the use of hours, or the use of descriptive terms (Light Use, Medium Use, Heavy Use), or the use of both hours and descriptive terms on the label. OPEI agrees that Class I and Class II engines and their applications require different terms of usage.

OPEI requested that a handheld product manufacturer would have the choice of using any of these three options to describe the Useful Life period. OPEI supports the use of the terms "Light Use", "Medium Use", and "Heavy Use" to characterize the three useful life categories applicable to handheld engines instead of the terms EPA has proposed. OPEI believes their proposed terms best meet EPA's objective of accurately describing the intended use to the purchaser. It is possible that a commercial operator may buy a product with a lower useful life but the usage pattern of the product would fit the description of the useful life. The integrated nature of handheld products allows a more transparent understanding of the durability of the product through marketing and other means.

OPEI noted that §1054.107(a)(4) deals with keeping information available to support Useful life selection. In addition, OPEI noted that page 88 of the Preamble states EPA intention to review Useful-life selection if not highest value. By default, if a manufacturer certifies to highest value, they are showing through cert testing that the engine meets the useful life period. OPEI commented that EPA should add language in §1054.107(a)(4) to confirm that EPA will approve the manufacturer's useful life selection without further demonstration if the manufacturer selects the highest available useful life value and submits data showing that the engine lasted that long as part of the durability demonstration for certification.

OPEI notes that §1054.107(a)(4)(i) life time surveys are a point of interest for most manufacturers; "If a manufacturer has data to support an engine/product has the majority of its family sales sold to a market (for example homeowner use) then the manufacturer may certify the product/engine to an appropriate useful life provided the data supports that majority of the product built and sold does not exceed the actual usage time." OPEI commented that if a manufacturer has a family where 70% of sales can be proven to be to homeowners and you can prove that a large majority, for example greater than 75%, of those homeowners will never use the product more than 125 hours before scrapping it, the manufacturer should be allowed to certify it to 125 hours even if the engine can be demonstrated to last longer.

EMA commented that it is critical that EPA recognize an engine's useful life period, as determined by the engine manufacturer prior to certification and production, does not dictate the ultimate equipment manufacturer or ultimate consumer's usage of the engine. There are a significant number of engines produced in this product category that will never be used for the prescribed emission durability period regardless of the years of use. There are also a very small

number of engines in this category that will accumulate hours at a much faster rate, and depending on the equipment design, may be replaced prior to the expiration of the emission durability period. In many cases this usage disparity exists within a single given engine family.

EMA commented that EPA's criteria for acceptance of useful life must be expressly established and documented in order to assure consistent treatment and a level playing field. A manufacturer's decision to select the longest useful life period should require the same justification as other useful life period selection. The criteria used to approve emission durability periods must clearly be identified in the regulatory text or preamble language. Manufacturers must receive guidance from EPA regarding what types of records EPA expects to review in the event it asks a manufacturer to substantiate its selection of an engine's durability period. In addition, EMA commented that the final rule should expressly acknowledge that industry survey information regarding product categories usage patterns, such as previous OPEI surveys, is acceptable documentation of a manufacturer's useful life selection.

EMA commented on the proposed statement required by §1054.135(c)(4) "How must I label and identify the engines I produce?" EMA objects to the statement and commented that the manufacturer should have the option to include language associated with the emission durability period in the compliance statement. Accordingly, there should be a reference to §1054.135(c)(12) in this section.

Letters:

Commenter	Document #
OPEI	0675
NESCAUM	0641
CARB	0682
EMA	0691

Our Response:

This is the only program in which we allow manufacturers the discretion to select an engine family's useful life. We believe this is a necessary accommodation for the reality that similar engines can be designed and used for widely varying purposes, users, and applications. Making this selection is nevertheless fundamental to defining the stringency of the standards that apply to the engine family so we strongly believe we should set up clear, objective, and practical guidelines for choosing an appropriate useful life in each case. We should also have a role of monitoring compliance with these guidelines and intervening in cases where a manufacturer is misusing the available discretion to assign an inappropriately short useful life. We have observed several cases under the Phase 2 program where manufacturers select the shortest available useful life for an engine family where the engines are clearly designed and marketed as long-life products for commercial applications. In contrast, some manufacturers have chosen a mix of useful-life values that seems to appropriately match the varying design parameters and intended usage patterns. Our intent is to create a program in which we can ensure that all companies are together taking this approach of responsibly pairing useful life with the expected in-use operating life.

As described in the proposed rule, we believe emission labels need to clearly state the manufacturer's selected value for the useful-life period, in hours. Under the regulation, manufacturers are directed to select the useful life that most closely correlates with the equipment's expected lifetime of service. We believe this decision is important not only for emission controls, certification, and compliance but also for consumers. If a manufacturer puts in additional engineering and product features such that an engine can operate twice as long as a competitor's engine while meeting emission standards throughout the longer useful-life period, that should be clearly identifiable to the consumer as a superior product. The current approach of identifying the useful life with a single-letter code does not communicate useful-life information clearly enough. Similarly, we believe that descriptive terms may be helpful in communicating useful-life information, but they cannot replace the objective value of identifying useful life with a universal and clearly understood metric. Including the engine operating hours to identify the useful life is the best way to achieve this.

We believe it may also be helpful to add descriptive terms to further characterize an engine's useful life. We will therefore allow manufacturers the option of using prescribed wording in addition to identifying the hour value for the useful life. We are adopting the terms described in the proposal for nonhandheld engines. We believe these terms are well matched to the range of uses for nonhandheld applications. We have no objection to the wording suggested for handheld engines. Using different terms may be helpful to avoid any confusion that may result from attaching the same descriptive terms to different useful-life values for handheld and nonhandheld engines.

Application	Useful Life (hours)	Descriptive Terms
Handheld	50	Light use
	125	Medium use
	300	Heavy use
Nonhandheld Class I	125	Residential
	250	Extended life residential (or general purpose)
	500	Commercial
	>500	Heavy commercial
Nonhandheld Class II	250	Residential
	500	Extended life residential (or general purpose)
	1000	Commercial
	>1000	Heavy commercial

We agree with EMA that the criteria for establishing an engine family's useful life should be clearly defined and evenly applied for certifying engines. We also agree that the selected value should not prevent equipment manufacturers from installing engines according to the their own judgments about which engine is best suited to their particular equipment models, and that owners should not be restricted in how (or how long) they use their engines or equipment. Information about how equipment manufacturers and owners are selecting, installing, and using

engines may factor into the engine manufacturer's decision regarding useful life, but once the engine family has a useful life, that value should not be limiting for equipment manufacturers or owners.

The regulation text we proposed and are adopting in §1054.107 is changed very little from the current regulation in §90.105, which was adopted in 1999. As described above, many engine manufacturers have been taking a responsible approach in exercising their discretion to select useful-life values. We therefore believe that the proposed regulation, with a few minor modifications, suitably defines the process for defining the terms and criteria for selecting useful life. Fundamentally, the regulations require that manufacturers select the useful life value that best represents the expected median in-use life of the equipment in which the engine will be installed, including specification of a variety of information types for supporting the selection. We do not expect a dramatic change from current practice for those manufacturers that are already making a good-faith effort to make proper selections. Making the effort to document the basis for making these selections, which is already required under §90.105, and subjecting those decisions to EPA review will ensure that all manufacturers receive equal treatment under the regulations. This will be a substantial improvement over the Phase 2 program where manufacturers may find themselves at a competitive disadvantage by making responsible useful-life selections.

While we believe the regulation is sufficiently clear in establishing the meaning of useful life and the process for making selections, we agree that further guidance will be helpful in taking the next step of making concrete decisions about which useful-life value most appropriately represents a particular engine family. This will give manufacturers assurance that useful-life selections will be made consistently across the industry, and will further help to ensure an orderly process for certification.

We agree with OPEI that engine manufacturers selecting the longest nominal value would not need to do any more than submit certification data showing that an engine representing the engine family operated long enough to appropriately establish deterioration factors. If there were any reason for a manufacturer to select a useful life that is too long (such as artificially generating credits from an engine family with a low family emission limit), we would see that under the Phase 2 program where we have not asked manufacturers to justify their selections. We have observed no such abuse under the Phase 2 program, so we have no reason to believe that would occur in the future. With no potential to require manufacturers to select a longer useful life, we therefore believe it is unnecessary for manufacturers to provide any additional information to justify their selection of the longest available nominal value for the useful life.

The regulation allows manufacturers to rely on product-specific surveys to establish the median life span of equipment in the field. It would not be appropriate to rely on broader surveys that characterize usage patterns or lifetimes for aggregated products, since that would provide no information that would demonstrate any greater reliability or durability that may apply for any particular engine family. It would not be appropriate to use industry averages to justify lifetime estimates for individual models. On the other hand, if a manufacturer has two engines with similar designs and technical features (such as one- and two-cylinder versions of an

otherwise common engine), it may be possible to draw conclusions about useful life for both engine families from a single survey. We would expect such a survey to avoid sampling criteria or other statistical methods that would distort the results.

Conducting a survey is most straightforward when an engine is installed in a small number of equipment models and is generally placed into service such that usage characteristics are relatively uniform. This situation is common for the highest-volume handheld and nonhandheld products. A more challenging situation occurs when engines are installed in a wide range of equipment models and users have widely varying usage patterns. In these cases, we would expect manufacturers to make sound judgments in selecting dominant equipment models, applications, and usage characteristics to determine a useful-life value that best represents the median lifetime of the range of equipment in which the engines are installed. This may reflect a combination of commercial and residential use. Surveys could also take into account the possibility that individual owners may choose to retire a piece of equipment before it has reached the point of no longer being able to run (for example, by upgrading to a new model with additional features). The manufacturers are generally selecting the useful life from three nominal values, so the goal of any survey is limited to establishing the proper useful life only to that level of precision. We would not expect manufacturers to estimate the median lifetime of in-use equipment to the nearest hour to be able to select the useful life for an engine family for certification.

In discussions following the close of the comment period, some manufacturers expressed concern that gathering information from the field to determine appropriate useful-life values for each engine family would be very costly and time-consuming. We will be learning together how detailed that information needs to be and to what extent the information can be shared across engine families. In the meantime, we would also encourage nonhandheld engine manufacturers to consider the alternative specified in the regulations allowing for useful-life determinations based on engineering evaluation. Toward that end, we have made an effort to correlate engine design features with useful-life values. We considered including these design features directly in the regulation, but chose to continue with the broader approach consistent with the current specifications in §90.105. To the extent that nonhandheld engine manufacturers are unable to easily gather information to establish median equipment lifetimes corresponding to their engine families, we would consider the engine design features in the following table to be an adequate basis for establishing the useful life for a given engine family. Manufacturers using the values as indicated in the table would need to provide no additional information. We are aware that pressurized lubrication and cast-iron cylinder liners can take different forms (or have different degrees of quality and durability), but we would consider any form of these technologies to correspond to the indicated useful-life values, since they are clearly intended (and expected) to provide substantial improvements in engine operating life. We may revise this approach to correlating engine design features to useful-life values based on testing or other information that allows us to more carefully establish median lifetimes for specific designs.

Design Features for Nonhandheld Engines and Corresponding Useful Life Values

Design Features	Useful Life
Pressurized lubrication and more than one cylinder	1000 hours
Pressurized lubrication or more than one cylinder	500 hours
Engine displacement at or above 225 cc or a cylinder liner	250 hours
Any other engine design	125 hours

Finally, manufacturers may choose to do testing instead of relying on survey information. In this case, we would envision the manufacturer assembling five pieces of equipment that best represent the engine family. Testing could also be done with engines on a dynamometer. These engines could be exercised until the point of failure under normal operating conditions with proper maintenance throughout. The point of failure for the third failing engine would determine the median lifetime for the engine family. The appropriate useful-life selection would be the nominal value that is at least as high as the measured median lifetime. Manufacturers would need to use good judgment in making a determination regarding the point of failure, including consideration of the cost and ease of repair in the case of component failure and including consideration of equipment performance in the case of reduced power output (from lost compression, for example). It would not be appropriate to consider a piece of equipment to be at the end of its lifetime if a typical consumer with access to a reliable mechanic would have it repaired or would otherwise continue using it. We would not accept the idea that a typical consumer would as a matter of course dispose of equipment where an evaluation of the cost of maintenance would justify continued use of the equipment instead of purchasing a new unit.

2.4.3 Other labeling issues

What Commenters Said:

EMA commented that EPA must recognize the fact that in order to fit on products that typically are small, engine/equipment emission labels for Small SI engines are very small by necessity. Given the small size of the emission label, EPA should reconsider the labeling requirements incorporated in the final rule. EPA should only require the most relevant information to be on the label. Currently, the NPRM requires that the engine/equipment emissions label include all of the following information: a numerical designation of the emission durability period; Family Emission Limit (FEL); rated or intermediate speed; identification of the emission control system; adjustment/tune-up information; altitude kit requirements; fuel and lubricant requirements; and winter use identification. The inclusion of all of this information is not only impossible due to the size of the label, but unnecessary. Most of the information required to be included on the label by the NPRM is information that is included in the certification application and more appropriately included in the owner's manual. In addition, emission labels are easy to counterfeit and the presumption that the inclusion of such additional information will prevent or dissuade counterfeiting is not valid.

EMA believes the information provided on an engine/equipment emission label must be easily read and understood. If EPA requires too much information on such a small label, the label will become cluttered, the size of the print will be extremely small, and the label will be difficult to read. Adding to the content of the label will not ensure compliance. In fact, adding additional content to the label will thwart EPA's labeling goals because it will prevent the easy identification of (i) the engine/equipment manufacturer; (ii) compliance applicability; and (iii) date of manufacture. EMA commented that in order to ensure a label that is effective, and easy to read and understand, the emission labeling requirements should be limited to the inclusion of the following important information:

a. Manufacturers corporate name or trademark
b. Engine family name (exhaust)/ evaporative code (evap)
c. Date of manufacture (month and year) unless it is stamped or engraved elsewhere on the engine/equipment
d. The following statements of compliance (where applicable, the word "engine" would be replaced with the word "equipment"):
    i. Exhaust - "This engine complies with U.S. EPA Exh. Stds."
    ii. Evap. - "This engine complies with U.S. EPA Evap. Stds."
    iii. Exhaust & Evap. - "This engine complies with U.S. EPA EXH/EVP STDS."

EMA commented that the proposed requirement to include the FEL on the emission label is not acceptable because it precludes the manufacturer from (i) accurately representing the FEL (in the CARB PLT Credit situation); and (ii) making necessary retroactive changes to an FEL level. In addition, this requirement will impose an undue burden on both engine and equipment manufacturers because it will require the manufacturer to create new labels (and dispose of old label inventory) every time an FEL is changed, and to maintain both original and supplemental labels. The addition of the FEL to the engine label does not add information that is valuable to the equipment manufacturer, the ultimate purchaser, or EPA, and creates additional unjustified burden on the manufacturer. For these reasons, and in light of the limited available space on the engine label, manufacturers should not be required to include the FEL on the engine label.

EMA commented that due to the limited size of the engine label, information that is more appropriately included in the owner's manual should not be required to be included on the emission label. They commented that EPA should require the following information to be included in the owner's manual instead of on the emission label: (i) identification of the emission control system; (ii) adjustment / tune-up information; (iii) altitude kit requirements; and (iv) fuel and lubricant requirements.

EMA is opposed to the new emission label requirements for winter exclusive engines. Winter exclusive engines are uniquely configured to run in cold climates (e.g., they do not typically have air cleaners, and often have winter calibrations and hot air ducting), and would not run well or last long in other types of applications. Winter exclusive engines already are adequately identified and discernable from non-winter exclusive engines by the engine family name, and the engine manufacturer's scheme for encoding this information into their family naming convention. Accordingly, EMA commented that there is no need to include this

information on the label. Such a requirement would unnecessarily take up space on an already crowded label.

EMA also opposed the additional requirement to identify rated or intermediate speed application restrictions on the emission label. This information does not add any value to the label content and should therefore be eliminated.

If EPA determines that it is necessary to identify delegated assembly engines on the emission compliance label, EMA commented that EPA should only do so with the use of an identifying mark on the permanent label, such as "DA" as an approved abbreviation for "delegated assembly."

Wherever possible, EMA commented that EPA should strive to minimize differences between EPA's and CARB's labeling requirements. The NPRM requires the following emission label heading: "EMISSION CONTROL INFORMATION"; while CARB requires either "IMPORTANT ENGINE INFORMATION" or "IMPORTANT EMISSION INFORMATION". There is no valid reason for EPA and CARB to have different emission label heading requirements. As such, EPA and CARB should align on this issue. In the past, EPA has accepted CARB label headings as an approved alternative. EMA urged EPA to include the CARB heading as an option in the final rule in order to avoid confusion and the need for additional approvals to achieve this critical alignment.

EMA believes the emission label is the appropriate location for identification of the manufacturer responsible for compliance and related emission warranty requirements. However, the NPRM appears to preclude those engine manufacturers that certify a complete engine (e.g., both exhaust and evaporative requirements) from using an integrated emission compliance label. EMA commented that engine manufacturers certifying a complete engine should be allowed to label products using a single emission compliance label. If the equipment manufacturer is the party responsible for introducing the complete evaporative control system into commerce, the equipment manufacturer should be allowed to provide the emission compliance label.

EMA commented on §1054.135(c)(5) stating that the requirement to include engine displacement on the label adds no value to either the customer or EPA and should be deleted from the labeling requirements.

EMA commented on §1054.135(g) stating that the proposed language would preclude engine manufacturers that certify a complete engine to both the exhaust and evaporative requirements defined in 40 CFR Part 1060 from using a viable integrated label. EMA commented that this section should be revised to read as follows: “Manufacturers that certify compliance to both the exhaust and evaporative requirements of 40 CFR Part 1054 and 40 CFR Part 1060 may meet the labeling requirements using a single label that provides all of the required information from both parts.”

EMA commented on §1054.136 “How must I permanently label the equipment I produce?” EMA commented that this section is redundant and should be deleted.

Honda requested that EPA reconsider the entire proposed requirements for engine labeling. Honda’s evaluation of the proposed label and contents that would be required for many

engines indicated that the label size and content would be significantly increased due to declarative statements and other label information, with little or no added value. Honda believes that a simplified label with the certifying organization identification or logo, engine manufacturer identification (corporate name or trademark) and a single alpha-numeric designator could fully signify engine regulatory compliance.

Honda commented that the information on a certification label has extremely limited value to anyone in the supply chain other than a U.S. Customs or EPA Inspector attempting to match the manufacturer and engine with a specific Certificate of Conformity and that engine's certification information. Furthermore, they believe the emission label information is of limited value to the engine purchaser, both individual and corporate, because they rely in their purchase decisions on business-relevant information such as model and engine type or catalog number which are typically stamped in the engine block or on another label. Fundamentally, the emission label does not receive any level of attention by or provide any usefulness to buyers or users, regardless of unit production volume.

Honda recognized EPA's concern for counterfeiting of labels, but they do not believe that EPA's proposal will prevent counterfeiting. Honda also recognized EPA's desire to provide distinction between uncertified and certified products. Nevertheless, they believe there is a much better and effective approach to addressing these two needs than merely expanding the information on a label. Specifically, Honda suggested that EPA work with industry to establish revisions to the certification application that would provide data for an EPA database that could be electronically accessed by those with a need to know (U.S. Custom's inspectors) and correlated with information that is part of the engine itself, e.g., stamped engine identification information or an engine identification number on the label. Perhaps the month and year of engine manufacture would be a necessary supplement if the manufacturer does not maintain a readily available database of serial number and corresponding date of manufacture. However, the manufacturer name on the label may also be redundant since it is typically on the engine itself and also coded into the engine family name.

OPEI noted that EPA's regulatory language states the label must contain month and year of manufacture with no allowance for variation (see 1060.135(b)(2) and 1054.135(c)(6)). OPEI commented that the minimum requirement should be month and year. Production time intervals less than a month should also be allowed, for example, week or day. OPEI also requested that the date of manufacture be allowed in a code on the label. (For example A06 means January 2006, B06 means February 2006.) OPEI stated that EPA currently allows for coded date of manufacture and should reflect this in the regulatory language.

OPEI commented that EPA has set precedence in the past for allowing for the deletion of the specific model year on the label and replacing it with a term like "this product complies with EPA Phase 2 standards" or "this product complies with EPA standards for 2002 and later." Since Class III, IV, and V handheld products have no exhaust changes, OPEI requested that EPA add language to §1054.135(c)(12) that will allow the use of standard language that will not need pre-approval for EPA such as: "THIS ENGINE COMPLIES WITH U.S. EPA PHASE 3 REGULATIONS FOR …" or "THIS ENGINE COMPLIES WITH U.S. EPA EXHAUST REGULATIONS FOR 2010 AND LATER MODEL YEAR"

Letters:

Commenter	Document #
EMA	0691
Honda	0705
OPEI	0675

Our Response:

All the information that we proposed to require on emission labels relates fundamentally to compliance with emission standards. This information is useful in varying degrees to consumers, equipment manufacturers, and EPA and Customs inspectors. We also note that manufacturers have been successful so far in creating and applying labels with all the information we require under the current regulations, without creating confusion or otherwise thwarting our labeling goals. Nevertheless, we agree with the suggestion in the comments that we should pursue alternative means to make some of this information available. In large part, our interest in narrowing the required label content is based on the disproportionate amount of time it takes to handle requests for variations from the regulatory specifications. As a result, we have gone through the effort to reduce the required label content to the minimum needed for the label to ensure compliance, given our (and the manufacturers') current and projected abilities to manage the additional information. By reducing the label content in this way, we believe we have also reached a point at which we can disallow any variations from the specified label content for these few pieces of information. This will significantly streamline the preparation, review, and approval of emission labels.

We generally agree with EMA's assessment regarding the essential elements of the emission label. The manufacturer's corporate name and the applicable family identification must be included. Manufacturers may add their trademark, but this is not required. The date of manufacture must be included, unless it is stamped or engraved elsewhere on the engine. A modified compliance statement must be included, as described below. We believe the label should include two additional items. First, as described in Section 2.4.2, the label must identify the engine's useful life. Second, if the family includes engines with differing displacement values, the displacement of each engine should be identified on the label. This would be the only way to readily determine which standards apply to each engine since the displacement information embedded in the engine family name would not necessarily apply. If manufacturers want to avoid separately identifying displacement information on the label in this situation, they could simply certify the engines in different engine families.

Further reducing content to include only a code for looking up all the information may be possible in the future, but we believe the EMA comments represent a more realistic middle ground for the foreseeable future. A label with nothing but a code for looking up relevant information would prevent the label from having any value without being able to access the database. We believe there will be times when owners, equipment manufacturers, and EPA and Customs inspectors should be able to identify the basic engine and compliance information by a simple visual inspection of the engine.

The label items included in the proposal but not in the final rule can be appropriately included in the owner's manual. This includes the identification of the emission controls system, tune-up specifications, information related to operation at high altitude, fuel and lubricant specifications, limitations on engine use at rated or intermediate speeds (if applicable), and limitations on engine use in wintertime equipment (if applicable).

While the owner's manual is useful for identifying these additional items, this is of little value to EPA or Customs inspectors or even to owners if they don't have or don't use the owner's manual, as is commonly the case. To address this concern, we may pursue system improvements that would allow us to readily access the database that includes this information. In this scenario, an inspector with a laptop or handheld device with Internet access would be able to use the engine family identification number to quickly look up all the highlighted information that is relevant for a given engine. This would allow us to create a very accessible virtual label without being constrained by space limitations.

As described in Section 2.4.1, we agree that emission labels do not need to include the applicable family emission limit. This is based on the alternative requirement to track changing family emission limits by date of manufacture and serial number rather than the reasons identified by the commenters.

See Section 1.3.2 for a discussion of build dates on labels, compared with engine manufacturers keeping records with this information. We agree that build dates should be based on identifying the month and year at a minimum. We don't believe it is appropriate to use coded information to identify the build date. This is especially important given the discretion we are allowing to create family codes for compliance with evaporative emission standards, as described in Section 4.6. Identifying the full month and year would be preferred (e.g., February 2009). We would also find standard abbreviations acceptable, such as Feb 09 or 02/09. We intend to pursue regulatory amendments to clarify the format of build dates on engines or emission labels, with the goal of adopting uniform specifications across all our programs.

Fundamental to certifying engines under the Clean Air Act is the idea that the certificate is valid for a given model year. Manufacturers must recertify all their engines for every new model year. In some cases a manufacturer may produce certified engines in a given year and not renew certification for the following year. This is a case where the model year information would be necessary to identify the compliance status of the engines properly produced under a valid certificate and to avoid improperly labeling for the engines produced when there was no valid certificate. We are also adding regulatory language to ensure that manufacturers properly align their build dates and overall production periods with the dates defining the model year for the particular engine family, as identified by the effective dates for the certificate. See Section 1.5.2 for further discussion of issues related to build dates and model years.

The information related to wintertime use and rated-speed/intermediate-speed operation is mostly intended for equipment manufacturers to ensure that engines are installed in equipment consistent with any applicable limits on the engines' certification. We believe these items should be included in the owner's manual for completeness. We also separately require that engine manufacturers make clear in their installation instructions that equipment manufacturers install

engines such that they remain in a certified configuration if there are any limits on the range of applications covered by the certificate.

We agree that an abbreviation for "Delegated Assembly" may be necessary. However we believe the abbreviation should be no shorter than "DEL ASSY". Such an abbreviation will allow for continued recognition of the terms for an informed reader/inspector, without resorting to a two-letter code that could ultimately be overlooked or misunderstood. This is especially important given the discretion we are allowing to create family codes for compliance with evaporative emission standards, as described in Section 4.

As described above, our primary motivation to reduce the label content as much as possible is to standardize labels and avoid requests for alternative wording and formatting. Accordingly, we do not believe it is necessary or appropriate to create a path for alternative labeling for the label heading. Our understanding is that California has agreed to allow manufacturers to meet their requirements with EPA's label heading, so this should not be an issue under the Phase 3 program.

We believe the proposed language in §1054.135(g) clearly and explicitly allowed integrated manufacturers to use a single label for meeting requirements for compliance with both exhaust and evaporative standards. We have nevertheless modified the wording to align with the language suggested in the comment.

We agree that the proposed §1054.136 does not add new requirements and is not necessary for highlighting other requirements that apply for equipment manufacturers. We have removed this section for the final rule.

2.4.4 Maintenance

What Commenters Said:

OPEI noted that the maintenance provisions for handheld engines are outlined according to §1054.145(c)(3). This paragraph allows the continued use of maintenance provisions outlined in EPA Phase 2 for certification and deterioration factor (DF) engines. OPEI also noted this provision has no expiration date. OPEI further noted that the maintenance provisions outlined in 1054.125 do not apply to handheld engines. OPEI requested that EPA add language to 1054.125 indicating this section does not apply to handheld engines.

EMA and OPEI commented that EPA should allow the following critical emission-related maintenance practices during the determination of deterioration factors based on the maintenance schedule provided to users: air filter, spark plug, valve lash adjustment, and two-cycle exhaust port carbon removal. These practices are well understood in the market place and have been utilized for many years in order to ensure that engines perform their intended function for their expected lifetime. EMA and OPEI also commented that EPA should explicitly acknowledge that the following maintenance practices are critical emission-related maintenance that cannot be conducted during the determination of deterioration factors: internal combustion

chamber deposit removal, valve or valve seat reconditioning (including lapping, grinding, or cutting), and replacement of exhaust aftertreatment components.

EMA commented that air filter maintenance generally is prescribed by the engine manufacturer for all customers. Such maintenance instructions typically include provisions that address adverse environmental conditions that may require more frequent maintenance. Depending on the air filter design, such maintenance could include cleaning or replacement. Engine deterioration factor determination must be allowed to utilize the maintenance as prescribed to the customers operating in a clean environment typically utilized for engine aging.

EMA commented that if there is a concern that manufacturer defined maintenance intervals are too close to prescribed emission testing points, the final rule should require both pre- and post-maintenance emission tests on a case-by-case basis. For example, CARB requires pre- and post-maintenance testing if the emission test point is within 10 hours of the prescribed maintenance.

EMA commented on §1054.125(a) "What maintenance instructions must I give to buyers?" EMA commented that the requirement to demonstrate that scheduled maintenance is reasonably likely to be performed is impractical. Small SI engine maintenance is typically done by either the owner or an independent dealer. For the individual home owner, maintenance intervals are typically dictated by seasonal time and use patterns. However, the same engine utilized by a semi-commercial owner/operator may be serviced routinely on a use basis. Typical maintenance not covered by defect warranty that involves cleaning (such as air filters) or adjustment (such as valve clearance) do not generate any documentation available to the engine manufacturer. Generically available items (such as spark plugs) are impractical for engine manufacturers to document due to the sheer number of suppliers and retail outlets selling such merchandise. EMA believes a limited and explicit list of acceptable emission-related maintenance must be identified in the final rule, along with a provision that allows engine manufacturers to demonstrate why additional critical emission related maintenance not specified in the rule should be allowed. EMA commented that allowable critical emission-related maintenance during service accumulation and emissions durability determination should include air filter cleaning/changes, valve lash adjustment and spark plug changes. The frequency of this maintenance must be consistent with the engine operator's manual. EMA commented that internal engine maintenance, such as decarboning of the engine combustion chamber, re-seating of the valves, or other maintenance should explicitly be included in §1054.125(a)(2).

EMA commented that the parts identified in §1054.125(d) "What maintenance instructions must I give to buyers?" must be revised in order to agree with the proposed revisions to §1054.125(a). Further, the second sentence should be revised to read as follows: "Noncritical emission-related maintenance generally includes re-seating valves, removing combustion chamber deposits, or any other maintenance related to emission-related parts as specified in 40 CFR Part 1068, Appendix I."

EMA commented on §1054.125(e) "What maintenance instructions must I give to buyers?" EMA commented that based on the proposed language in §1054.125(a), valve lash should be removed from the list of potential non-emission related maintenance.

EMA commented on the definition of critical emission-related components set forth in §1054.801. EMA commented that the proposed definition does not include air filters or spark plugs. They noted that such parts are included in the definition of critical emission related parts elsewhere in the proposal.

Kohler commented that it has concerns with the current maintenance allowed during DF testing in Part 90 and the wording in the proposed regulation §1054.125(a). Kohler commented that normal maintenance should be allowed to be required in the owner's manual without performing surveys etc. Any maintenance such as changing sparkplugs, air filters, and oil are all normal and accepted by industry and should not require any special survey or demonstration on the part of the manufacturer to be allowed to include them as a requirement in the manual.

Kohler noted that §1054.125(d) states that you cannot change an air filter or sparkplug during service accumulation. Kohler commented that this statement needs to be changed to "you cannot change an air filter or sparkplug during service accumulation for DF testing at intervals different than that specified in the owners manual."

CARB noted that EPA proposed to allow emission-related maintenance during DF testing if "60 to 80 percent of in-use engines get the specified maintenance at the recommended interval." As noted in the preamble, the small spark-ignition engines are predominantly operated by homeowners and experience widely varying service practices. To ensure that the DFs do actually represent in-use engines, it is crucial that maintenance that is not likely to be performed in-use is not allowed for test engines. To strike a balance, CARB recommended alignment with other maintenance-related provisions that were adopted recently for the on-road heavy-duty category requiring an 80 percent survey and other provisions.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
Kohler	0703
EMA	0691

Our Response:

We agree that the maintenance provisions of §1054.125 do not yet apply to handheld engines (as specified in the proposed §1054.145(c)(3)). This is necessary because we are not changing the stringency of the exhaust emission standards for handheld engines. Changing the allowable maintenance during service accumulation for certification could affect emissions in a way that would effectively change the emission standards for those engines. We expect to apply the provisions of §1054.125 to handheld engines without modification when we adopt the next

phase of standards for those engines. We therefore agree that it is appropriate to add a note to §1054.125 to clarify that the maintenance provisions of that section do not apply to Phase 3 handheld engines.

We also agree that the regulations should clearly disallow removal of combustion chamber deposits, reconditioning of valves and valve seats, or replacing aftertreatment components. These would rarely be performed as normal maintenance practices by owners so they should also not occur during service accumulation for certification. We note too that we have no reason to believe that carbon removal from exhaust ports on two-stroke engines can be considered normal maintenance, so we do not believe that would be an appropriate maintenance step during service accumulation. We expect that all two-stroke engines certified to Phase 3 standards will be handheld engines. As described above, the provisions of §1054.125 do not apply to handheld engines, so we will revisit the question of maintenance for these engines when we adopt the next phase of standards. We do not expect to allow carbon removal from exhaust ports during service accumulation unless there is clear evidence demonstrating that this maintenance is typical for in-use engines.

It is clear that some owners clean or replace air filters and spark plugs on the schedule prescribed in the owners manual. This would be the case for fastidious homeowners wanting to make their equipment last as long as possible or commercial owners interested in reducing the costs associated with repairing or replacing aged equipment. We remain unconvinced that in-use maintenance related to air filters and spark plugs is so prevalent that manufacturers should perform these maintenance steps during service accumulation. There are surely many owners who, perhaps in spite of best intentions, fail to invest the time, effort, and expense of preventive maintenance. There is clearly some tendency to treat Small SI engines and equipment as disposable items, running with minimal maintenance until a problem surfaces, then evaluating whether to make a repair or just replace the equipment. Especially with low price-point consumer products, repair costs (and even some preventive maintenance costs) would be high enough that many owners would minimize maintenance and repairs and opt instead to purchase a replacement model after a few years. Even for commercial operations, Small SI equipment many times would represent a small part of a much larger operation. As such, companies operating these engines would in many cases not make it a priority to coordinate a regular schedule of preventive maintenance. For both homeowners and commercial users, we believe the likelihood of taking preventive maintenance steps on the prescribed schedule falls dramatically after the first year of service (or for second owners). Performing a survey to establish current maintenance practices would be very helpful, but we understand the constraints on getting this information described in the comments.

Limiting maintenance during service accumulation for certification to align with the prevailing in-use practice is important to avoid a situation where manufacturers are able to achieve the necessary level of emission control in the laboratory while in-use engines are emitting at higher levels because these same maintenance steps are not being done. To the extent that maintenance might not be performed in the field, manufacturers should have the incentive to design their engines such that they do not depend on this maintenance to comply with emission standards. For example, as described in the proposal, we are concerned that air filters may become coated with oil mist on the downstream side. Intake systems can be designed to prevent

this by carefully designing the pressure dynamics of the intake system and the venting of crankcase gases (and oil mist) into the intake system to prevent the entrained oil from reaching the back side of the air filter. In contrast, if we allow routine air filter changes as prescribed in the owners manual, there is no need to improve these designs, even though the problem would occur with any in-use engines that do not get the scheduled filter changes.

Having said that, we also note that our testing to establish the feasibility of the proposed standards involved a rigorous effort to perform maintenance as prescribed in the respective owners manuals, which generally involved air filter maintenance every 25 hours and spark plug changes every 100 hours. Based on this experience, we don't believe we should entirely disallow these maintenance steps for certification for demonstrating compliance with the Phase 3 standards. We therefore believe it would be appropriate to allow manufacturers to clean or change air filters and spark plugs, as long as manufacturers perform emission measurements before and after these maintenance steps. It would be best to perform testing after each maintenance step; however, we would find it acceptable if manufacturers tested engines before and after maintenance after every other air filter change. Manufacturers would use the average of these two results for calculating deterioration factors. However, every measured test point would need to be under the emission standard to be considered in compliance. This approach allows for continued performance of these maintenance steps, consistent with our feasibility testing, but properly identifies the effect on emissions.

Most Class I engines are certified with a useful life of 125 hours. Since manufacturers do durability testing halfway through the useful life, this would be a normal point of replacing the air filter. If manufacturers specify filter replacements every 25 hours, this would involve only a small adjustment to fit with the planned testing. If manufacturers specify filter replacements every 25 hours, they would need measure emissions before and after changing the air filter after the second filter change at 50 hours, or they could opt for a 30-hour filter change interval and simply test at the scheduled midpoint for service accumulation.

Laboratories where service accumulation occurs generally have very little dust or airborne debris that is common in the in-use environment. We believe it is well within reach for manufacturers to design their engines for extended operation without needing cleaning or replacement of air filters. We believe this approach properly balances the manufacturers' interest of performing maintenance during certification with our interest of documenting the emission effects of this maintenance and maintaining the incentive for manufacturers to design their engines to be dependent on maintenance as little as possible.

Some Class I engines and all Class II engines are certified with a useful life of 250 hours or longer. Testing these engines at the midpoint of their service accumulation involves a correspondingly longer period. At the extreme, a 1000-hour useful life would involve testing after 500 hours of operation. To avoid additional test points, manufacturers would need to design their engines to meet standards without cleaning or changing air filters for 250 hours or spark plugs for 500 hours. While this involves a greater challenge, we think it is even more achievable for these engines where the reduced price sensitivity does not impose such a challenging constraint in properly designing and manufacturing these engines. We believe these longer useful-life engines should be capable of operating on a controlled test fuel in a controlled

environment for 250 hours without servicing air filters and for 500 hours without replacing spark plugs. However, as described above, we believe it is appropriate to allow for more frequent service as long as the manufacturer performs emission tests before and after the maintenance to document the effect on emissions.

In pursuing more stringent emission standards in the future, we intend to more carefully demonstrate the feasibility of achieving effective emission control over the full useful life with maintenance intervals that more appropriately reflect any reduced level of service that may be typical of the in-use experience for Small SI engines. We would then be able to set more careful limits on the maintenance that manufacturers may perform during service accumulation such that certified engines will not depend on maintenance that may not be occurring with in-use engines.

We have modified §1054.125 and §1054.801 to include air filters and spark plugs as critical emission-related maintenance.

Consistent with the proposal and all our other programs, we believe that adjusting valve lash is not emission-related maintenance. Including valve-lash adjustments in §1054.125(e) allows manufacturers to perform this maintenance during service accumulation at the least frequent interval specified in the owners manual. This approach addresses the manufacturers' interest in performing this maintenance on their recommended schedule.

The first four paragraphs of §90.118 were adopted as part of the initial phase of standards, in which there was no service accumulation beyond engine stabilization. When part 90 was modified for the Phase 2 standards, there were no changes in the regulation to add specific requirements or prohibitions related to maintenance during the service accumulation period between stabilization and the end of the useful life. As such, we have concluded that only oil and filter changes may be done before stabilization is complete, and manufacturers may follow the scheduled maintenance specified in the owner's manual for the rest of the service-accumulation period.

2.4.5 Deterioration factors/bench aging

What Commenters Said:

OPEI and EMA commented that EPA should allow for the future development and use of an aftertreatment bench aging procedure. However, due to the complexity of such development, the limitations and appropriateness of any procedure must adequately be assessed.

OPEI commented that if a manufacturer can show that due to field-testing, the bench DF cycle is too aggressive, EPA may approve an alternative test cycle based on data the manufacturer provides.

OPEI noted per CARB requirements that the calculation of a DF must involve at least three test points (zero/midpoint and end of test). If a maintenance interval is scheduled at a test point, the emission test should be run both before and after the maintenance. The emission test

results should then be averaged for the value to be used in the calculation. OPEI commented that EPA should specify the same requirement in §1054.245 to avoid confusion.

CARB commented that operating and testing the complete engine is necessary to get accurate deterioration factors (DF). They noted that some manufacturers are using bench-aging of components, including catalysts, to identify the worst-case scenario amongst models/components. Subsequently, DFs are developed on the worst-case model/configuration using full service accumulation on a dynamometer or in-use. CARB commented that bench-aging of components and other alternative procedures should be allowed only if manufacturers provide adequate correlation data between their aging procedure and normal service accumulation. Regarding assigned DFs, CARB commented that these should be limited to just California small-volume manufacturers (less than 500 total units per year). Other manufacturers are required by California regulations to develop their own DFs so EPA's use of those same DFs would not impose any burden on manufacturers.

ECO noted that EPA proposed an allowance for small volume engine families to utilize assigned deterioration factors and requested input on the use of assigned DFs for small volume engine families. ECO commented that this provision is necessary to allow flexibility for small volume engine families.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
EMA	0691
ECO	0712

Our Response:

We understand that a bench aging procedure has the potential to provide effective deterioration factors at a substantially lower cost compared with aging engines with complete systems on an engine dynamometer. As noted in the proposal and reiterated in the comments however, we would want to be very sure that a specific bench aging procedure would adequately represent aging from complete in-use engines. A fundamental factor in evaluating the appropriateness of any bench-aging procedure is the extent to which it simulates representative exhaust gas composition and other in-use operating parameters. Any bench-aging procedure would therefore need to take into account a wide range of variables to provide an adequate simulation.

We agree that the regulation should be changed to require testing at the midpoint of service accumulation. This provides additional information and aligns with the requirements already in place in California. See Section 2.4.4 for a discussion of issues related to maintenance during service accumulation.

We continue to believe it is appropriate to include a provision for assigned deterioration factors for small-volume engine families, even if the certifying company is not a small business.

There may be several cases where the manufacturer produces only engines for equipment that is preempted from California regulations, or that is not sold in California at all. We agree that it is not helpful to allow for assigned deterioration factors where the engine manufacturer will have to develop its own deterioration factor for the same engine family in California. However, we would not want to disallow the use of assigned deterioration factors for those small-volume engine families where the manufacturer does not need to do service accumulation to establish a deterioration factor for California.

2.4.6 Warranty

What Commenters Said:

EMA commented that engine manufacturers must have the ability to shorten emission warranty periods for engines that accumulate hours at a high rate such that they exceed 50% of their specified emission durability period prior to the expiration of the prescribed emission warranty period.

EMA commented that the proposed emission related warranty parts list requirements duplicate the information provided in 40 CFR Part 1068, Appendix I. They recommended that the emission related parts list be inclusive of the emission related components identified in the certification application, which also references 40 CFR Part 1068, Appendix I.

EMA commented that for engines certified using aftertreatment or intake systems supplied by the equipment manufacturer under the delegated assembly provisions defined in §1054.610, that the warranty requirements be transferred to the equipment manufacturer. Engine manufacturers should be required to maintain a cross reference such that any customer request for warranty associated with a component provided by the equipment manufacturer would be referred to the appropriate equipment manufacturer.

EMA commented on §1054.120 "What emission-related warranty requirements apply to me?" EMA commented that the regulations should be revised in order to clarify to whom the section applies. Specifically, they recommended that the section be revised to read as follows: "The requirements of this section apply to the manufacturer that certifies compliance with the exhaust emission requirements of this part. See 40 CFR Part 1060.120 for evaporative emission warranty requirements."

EMA noted that under §90.1103(a), the warranty period should begin on the date of sale to the ultimate purchaser. Accordingly, EMA commented that the sixth sentence of §1054.120(b) "What emission-related warranty requirements apply to me?" should be revised to read as follows: "The warranty period begins on the date of sale to the ultimate purchaser." They also commented that this section should provide an option for decreased warranty period in order to provide a differentiation between consumer and commercial usage of non-handheld products similar to what is provided for handheld equipment in §1054.120(b)(2). Finally, EMA commented that EPA should add the following language as §1054.120(b)(4): "Any end user that purchases a Consumer Product and uses it Commercially will have a shorter warranty period."

Honda commented that nonhandheld engines in commercial equipment should also specifically have the same option granted for handheld seasonal equipment, to limit the warranty time period based on the product's use even without an engine or equipment hour meter. This suggestion is made in reference to §1054.107. Honda noted that it is in §1054.120(b)(2) where EPA has made an allowance for the seasonal use of handheld equipment. The regulations state, "We may establish a shorter warranty period for handheld engines subject to severe service in seasonal equipment if we determine that these engines are likely to operate for a number of hours greater than the applicable useful life within 24 months. You must request this shorter warranty period in your application for certification or in an earlier submission." EPA has in this section recognized that commercial equipment is very likely to be used for many more hours in less calendar time than would be expected for homeowner operated equipment.

Letters:

Commenter	Document #
Honda	0705
EMA	0691

Our Response:

We believe §1054.120 appropriately defines the engine components that are subject to the emission-related warranty. The commenter's suggestion for the warranty to cover only those parts listed in the application for certification would allow manufacturers to avoid warranty coverage for a given component simply by leaving it out of the description in the application. The broader language included in §1054.120 is necessary to ensure that components will be covered even if manufacturers develop an emission control technology with components that would not be covered by the specific list given in Part 1068, Appendix I.

The certificate holder always bears the primary responsibility for ensuring that engines have proper warranty coverage. Certifying engine manufacturers may choose to cooperate with equipment manufacturers in the interface with owners, but we would hold the certificate holder responsible for compliance with warranty obligations. We could also pursue recourse against equipment manufacturers, importers, or retailers for having caused the violation if we are able to establish that any of those parties did not take basic steps to ensure that there was an effective plan for meeting warranty requirements.

The provision for shorter warranty periods for handheld engines used seasonally in severe service can work because the companies making the engines also install the engines in their own equipment. They can therefore understand the range of expected operation in the field for their certified engines. (We note, however, that no handheld manufacturer has requested this shorter warranty for engines used in seasonal equipment.) This is generally not the case for nonhandheld engines. Even those manufacturers that also make equipment will sell many loose engines from the same engine family to other equipment manufacturers. It is therefore difficult to conceive of an engine manufacturer being able to adequately demonstrate the seasonal or severe-duty nature of the expected in-field operation. While this may occur for some engine installations, there could be many other installations where equipment manufacturers and/or owners simply want a more reliable engine for operation that is neither seasonal nor severe-duty.

We note too the increasing likelihood that commercial engines will have electronic controls and fuel injection. While these will be simple systems, they will include the ability to clock engine operating hours. Since we allow for a shorter warranty period based on engine operating hours, it would be unnecessary for manufacturers to have any special approval for a shorter warranty period based on seasonal and severe-duty operation.

We don't believe it is appropriate to specify that a shorter warranty period applies for commercial use of products that are intended for consumer applications. Many types of equipment are not clearly differentiated between consumer and commercial applications. Similarly, a person's use of any given piece of equipment is many times not easily distinguishable between consumer and commercial applications. The suggested language could therefore not be clearly applied to adjust warranty periods for these products. As described above, we believe the best long-term approach is to anticipate that many or most engines in commercial service will have hour meters that will indicate an end to the warranty period based on the engine's operating hours rather than counting months on the calendar.

We agree that §1054.120 should more carefully state that the section applies to manufacturers that certify with respect to exhaust emissions, with part 1060 covering warranty obligations with respect to evaporative emissions. We also agree that the warranty period should start at the point of sale rather than the date the engine is placed into service, consistent with the prevailing practice for standard warranties on consumer products. This avoids a situation where owners could make unverifiable claims that they first placed the engine into service several months after making the purchase.

2.4.7 Naming labs and ports for imported products

See Section 1.3.1 for an analysis of the comments related to the requirements for importing manufacturers to identify the ports where they import products and to name a laboratory in the United States for testing their engines.

2.4.8 Engine family criteria

What Commenters Said:

OPEI commented on §1054.230(b) recommending that EPA should include in the list that families with displacements within 15% can be grouped together. This has been proven reliable and acceptable for EPA Phases 1 and 2 as well as CARB Tier I/II/III.

EMA noted that engine manufacturers producing multi-fuel engines recognize that they must evaluate the different fuel influences in order to determine the worst case configuration associated with the compliance demonstration for any engine family. EMA commented that it is important that engine manufacturers be allowed to utilize their best engineering judgment in order to determine which fuel and resulting engine configuration represents the worst case configuration for a given family and, therefore, be used for the certification data development

process. For example, an engine family may include both propane and natural gas fuel options for an engine model, but the engine manufacturer should be allowed to determine the worst case configuration for certification testing using their best engineering judgment.

EMA commented on §1054.230(b) "How do I select emission families?" EMA noted that pursuant to 40 CFR Part 90.116(d)(5), engines of different displacements that are within 15% of the largest displacement may be included within the same engine family. While this flexibility is implicit in the proposed rule, EMA requested that EPA include a statement in the preamble clearly stating that the intent of the language is to allow engine models of varying displacements (such as specified in §90.116) to be combined into one family at the manufacturer's option.

EMA commented on §1054.230(f) "How do I select emission families?" EMA commented that because Part 1054 does not identify the requirements associated with obtaining an evaporative certificate of compliance, it is not appropriate for this section to discuss evaporative component selection. Because all of the evaporative requirements refer the engine manufacturer to Part 1060, EMA commented that it is both redundant and confusing to include evaporative requirements within the requirements controlling the exhaust certification process.

Honda commented that the engine family determination criteria in the final rule should state that engines with a 15% displacement difference (percentage based on largest engine) may be in the same engine family if they have similar emission characteristics. Honda also commented that if a manufacturer can demonstrate that engines with a larger displacement difference also have similar emission characteristics, the manufacturer should also be able to get approval for inclusion in the same family.

Letters:

Commenter	Document #
Honda	0705
OPEI	0675
EMA	0691

Our Response:

Under part 90 we have approved the combination of engines within a single family if the range in displacement is within 15 percent of the largest engine's displacement. The proposed regulatory language for part 1054 specifies that engines must have the same "approximate bore diameter of cylinders." We have adopted this language broadly across most of our programs. We are adopting the proposed regulatory language without modification. We believe this is the best approach, giving a clear guideline but allowing enough discretion to be able to respond to any particular situations that may arise. We will continue to approve combined engine families based on the 15-percent displacement threshold. This maintains a harmonized policy with California and is generally consistent with the way we have implemented other EPA programs. We may also decide in special circumstances that a different threshold should apply.

We agree that dual-fuel engines represent a special case for differentiating engine families. Clearly one engine that can run on multiple fuels must be in a single engine family. The approach EMA describes in which the engine manufacturer chooses the worst-case fuel for certification testing is appropriate. We note, however, that an engine that fails to meet the applicable emission standards when operating on any of the specified fuels is noncompliant. We have revised the regulatory language to clarify that fuel type differentiates engine families, except in the case of dual-fuel engines. We have also added a clarification to §1054.235 to say that we may require manufacturers to submit data using the fuel not yet included in testing, and that such a test would be treated as if it were a second engine rather than a replacement for the original data.

We agree that §1054.230 should reference part 1060 to clarify how to define emission families with respect to evaporative emissions, rather than including that information directly. The final regulations have been changed accordingly.

2.4.9 Other certification issues

What Commenters Said:

OPEI noted that EPA is asking manufacturers to report CO_2 in §1054.205(p). OPEI questioned why EPA was asking for the information and commented that if EPA wants CO_2 reported, then manufacturers should be provided with requirements on how it should be reported (units, calculation etc).

OPEI commented that under paragraph 1054.640(c), if the manufacturer is responsible to EPA, then paragraphs (a) and (b) are an unnecessary burden and should be deleted.

EMA commented that EPA should clarify where in the certification application the additional information required by §90.107(d)(11)-(15) should be included.

EMA commented on §1054.130 "What installation instructions must I give to equipment manufacturers?" EMA commented that installation instructions for equipment that is not subject to the provisions of the delegated assembly requirements in §1054.610 should be limited to features consistent with the requirement to assure that the engine is in its certified configuration. EMA noted that these instructions are generally not explicit instructions, but rather a process used by engine manufacturers to approve the use of their engine in any equipment according to the engine manufacturer's requirements. For example, exhaust back pressure or intake air temperature rise may be specified to assure emission compliance and also expected performance. Accordingly, EMA commented that this section should be substantially revised to read as follows:

> "(a) If you sell an engine for someone else to install in a piece of equipment, make available the information required to ensure that as installed the engine will be in its certified configuration.
> (b) If the engine does not include provisions to control evaporative emissions advise the equipment manufacturer to refer to 40 CFR Part 1060 for applicable requirements.

> (c) Provide information to the equipment manufacturer that if installation precludes visibility of the engine's emission control label that a duplicate label must be added to the equipment in a visible location."

EMA commented on §1054.205(o)(1) "What must I include in my application?" EMA commented that the reference to THC or THCE should be expanded to include NMHC as required by §1054.103(c)(2).

EMA commented on §1054.250(a) "What records must I keep and what reports must I send to EPA?" EMA commented that the requirement to submit volume reports within 30 days is inconsistent with current EPA requirements, is not adequately defined, and is inappropriate. EMA noted that existing reporting requirements provide manufacturers 45 calendar days for reporting. Accordingly, EMA commented that the reporting requirement should be revised to 45 calendar days.

EMA commented on §1054.250(b)(4) "What records must I keep and what reports must I send to EPA?" EMA commented that it is not practical to require manufacturers to maintain production volume records for each engine family by assembly plant. In many cases, there are multiple steps in the assembly process that may be completed at different assembly plants thereby making this information either meaningless or impractical to determine. EMA recommended that this record retention requirement should be revised to require records regarding the total production volume for each engine family.

Kohler commented that a consistent test cycle between engine manufacturers is critical to maintaining a level playing field. This applies to both dynamometer emissions testing as well as DF hour accumulation. Kohler requested that in the Phase 3 regulation, EPA take action to maintain a level playing field for all manufacturers by assigning alphanumeric designators to all approved alternative test cycles and posting these to the EPA website. This would include alternate procedures for dynamometer testing as well as the approved cycles (speed/load/time) for DF hour accumulation. Kohler had the following recommendations for specific language modifications.

> §1054.501 (c) Alternate test procedures — EPA allows engine manufactures to request approval for the use of an alternate test cycle if they cannot run the test cycle specified in this part. If an engine manufacturer requests and receives approval these MUST be given an alphanumeric designation and posted on the EPA website and be available for anyone to use.

> Kohler noted that §90.104 (h)(2)(ii) currently states that engine manufacturers should . . . "Conduct such emission testing again following aging the engine. The aging procedure should be designed to allow the manufacturer to appropriately predict the in-use emission deterioration expected over the useful life of the engine, taking into account the type of wear and other deterioration mechanisms expected under typical consumer use which could affect emissions performance. If more than one engine is tested, average the results and round to the same number of decimal places contained in the applicable standard, expressed to one additional significant figure".

Kohler noted that there is no specific aging procedure defined. Many manufacturers today, including Kohler, use repetitive cycles of the 6-mode certification test cycle for aging the engine.

However, there is no public information available that states what procedure is being used by individual engine manufacturers. To maintain a level playing field Kohler requested that the following wording be used in the regulation:

> "Conduct such emission testing again following aging of the engine. The aging procedure must accumulate service (age the engine) in a way that represents how you expect the engine to operate in use and be approved by EPA. EPA's approval will assign an identification code for the cycle to be utilized in the manufacturer's certification application(s) for all applicable engine families. Approved test cycles will be listed with their respective identification code on the Small Spark Ignition Certification website and available for any applicable engine family. If more than one engine is tested, average the results and round to the same number of decimal places contained in the applicable standard, expressed to one additional significant figure."

Letters:

Commenter	Document #
OPEI	0675
EMA	0691
Kohler	0703

Our Response:

We require manufacturers to submit emission results for CO_2 only where those measurements are needed to determine emission levels of regulated pollutants. If this information is routinely gathered as part of emission testing, there is a minimal reporting burden for manufacturers. We want to be able to access this information to help us assess the reported results for the regulated pollutants. We have revised the regulation to clarify that these results should be reported as brake-specific values (g/kW-hr).

We believe that the branding provisions of §1054.640 include basic information necessary for ensuring that equipment manufacturers will fulfill their warranty obligations. We agree that we can omit the requirement for engine manufacturers to describe the specific arrangements in their application for certification, but we believe it is necessary for the engine manufacturer to formalize the arrangements in the form of a contractual obligation, and it is quite appropriate to inform us of all the equipment manufacturers with whom this relationship exists.

The references to THC and THCE are simply given as examples, so there is no need to include NMHC as another example. However, it is not incorrect, so we have modified the regulation accordingly.

We agree with the commenter that installation instructions should be focused on ensuring that engines are in their certified configuration after installation in equipment. Our proposed regulation included several specific details, such as referencing altitude specifications where appropriate, clarifying information related to evaporative emission controls, describing limits on installations (such as being certified only for use in rated-speed applications), and adding a note that duplicate labels may be necessary. The proposed provisions are well established in many of our other programs and they include only as much as we believe is necessary to achieve the

commenters stated goal of ensuring that engines are in their certified configuration in the final installation.

We agree with manufacturers that submitting production reports within 45 days after the end of the model year is sufficient.

If it becomes clear that defective engines are limited to production processes or other practices at a particular production facility, both we and the manufacturer would want to understand how isolated the problem is. This would apply both for applying a remedy and assessing penalties, if appropriate. We believe manufacturers should be keeping these records as a matter of course for business reasons, so we expect there is no additional burden to keep this information. If production is divided into multiple steps across multiple facilities, manufacturers should still be able to identify the number of engines that were processed at each facility.

EMA's concerns about certifying fuel lines under §90.127 are moot because we are revising these requirements to apply to component manufacturers.

We agree that EPA's process for approving certification and testing procedures should be transparent. However, we believe the best approach for accomplishing this is administratively rather than by regulation. We may develop a process consistent with Kohler's suggested approach, but we need to maintain the flexibility to develop and modify those processes based on our continuing experiences rather than limiting ourselves to a specific approach in the regulation. We look forward to working with manufacturers over time to continue to improve our processes for evaluating such requests and communicating the results of this decision-making.

2.5 Test procedures

2.5.1 NHH duty cycle/governor

Comment	Response
EMA commented that the NPRM's requirement that engines operate utilizing the engine's installed governor for the idle mode is not appropriate for many engines. A significant percentage of engines in the Small SI category do not utilize the engine governor to control speed at idle. Such engines utilize a fixed throttle position, generally determined by an adjustment screw. For engines that do not utilize the governor to control idle speed, the test condition should represent the expected in-use idle speed control condition rather than the governor.	We agree that the regulations should reflect the situation in which no engines in the family have governors that control idle speed. The definitions and testing provisions in part 1054 and part 1065 specify that engines without governors controlling idle speed should be set at the idle speed declared by the manufacturer.
§1054.235(c)(4). EMA commented that it is impractical to recalibrate an emission test engine within normal production tolerances as described in this section. §1054.235(a) requires the test engine to be selected based on the identified criteria and to be "tested as they will be produced". Artificial modification via recalibration is an overly broad requirement that should not be granted to EPA to use in its discretion. EMA commented that this provision should be deleted.	The proposed provision is limited to items that are not considered adjustable parameters. As noted in the definition of the term, this might include adjustments that are not emission-related or that manufacturers ask us to exclude. To the extent that production tolerances allow for varying engine settings, these items should be subject to calibration settings such that the testing configuration represents the full range for in-use engines. This provision is already in place under

	§90.119(b)(2)(iii).
§1054.501(b)(1). The reference to engines without throttle control is confusing and inappropriate. As properly defined elsewhere in the proposed rule, the engines in this category are generally considered constant speed engines for emission testing purposes. Engines in this category can have a wide variety of controls including: (i) no user control of speed, (ii) user control of the maximum speed, and (iii) load sensitive automatic idle speed. EMA commented that this section should be revised to eliminate the first portion of the second sentence that it reads as follows: "See 40 CFR Part 1065.10 for instructions for using alternate procedures if utilizing the procedure specified in 1054.505 would result in emissions that do not represent in-use emissions."	We agree that the provisions in question are best addressed elsewhere. We have removed the text in question from §1054.501(b)(1). See §1054.650 for provisions related to certifying engines without governors or with variable-speed governors.
§1054.501(b)(3). EMA commented that the proposal disallowed correcting emissions for the effects of humidity. EMA commented that this restriction is not consistent with EPA's current requirements as set forth in §90.419. Many laboratories do not have EPA's ability to run at a controlled humidity. Accordingly, EMA commented that the humidity correction factor for NOx emissions calculated per §1065.670 should be required for a valid emission test.	We agree that the humidity correction in §1065.670 is appropriate for Small SI engines. We have revised the regulations accordingly.
§1054.501(d). EMA commented that engine manufacturers must be allowed to use good engineering judgment in order to determine engine changes associated with the prescribed emission test temperature. The ambient emission test conditions are not representative of in-use conditions for winter exclusive products, but ambient test conditions cannot be achieved in the test environment that equate to in-use conditions. For example, winter exclusive engines cannot operate in the prescribed emission test conditions without removal or modification of air intake heating systems such that intake air temperature during the emission test is representative of intake air temperature when the engine is operated in-use. EMA recommended that the following be added: Engines may be modified for emission testing such that intake temperatures are analogous to in-use conditions.	We agree that manufacturers should be allowed to remove intake air heaters when testing wintertime engines at temperatures between 20 and 30°C and have modified the regulations accordingly. We have also added a provision allowing manufacturers to test wintertime engines at reduced ambient temperatures by referencing the existing specifications for snowmobiles in §1051.505. In addition, we are adding language to §1054.501 to say that non-wintertime engines should be tested in a way that properly simulates in-use intake air temperatures. We want to avoid a situation where manufacturers cool the intake air after it has warmed up from exposure to engine heating. This is clearly not appropriate since that type of cooling does not occur during in-use operation.
§1054.505(a)(1). EMA commented that the reference to 40 CFR Part 1065.514 must clarify that these engines are considered constant speed engines pursuant to §1054.505(b) and therefore only torque statistics are required.	We agree that the reference to §1065.514 should be limited to torque-related measurements. There are certain modes where manufacturers must control speed within certain bounds, but these are specified separately in §1054.505.
§1054.505(c)(2). EMA commented that if EPA does not accept our proposed revisions to §1054.801 (see comments in Section 2.5.3 below), this section must be revised in order to delete the phrase "maximum test torque" and replace it with the following language "full-load torque value from §1054.505(d)(2)."	We agree that §1054.505(c)(2) should reference §1054.505(d)(2) for the appropriate torque value, rather than relying on maximum test torque as defined in §1065.1001.

Letters:

Commenter	Document #
EMA	0691

2.5.2 HH duty cycle/governor

What Commenters Said:

OPEI commented that Max power, as defined in 1054.801 and in 1065.601, are in conflict. OPEI commented that EPA needs to make clear that the power from 1054 applies for handheld products during the cert test.

Letters:

Commenter	Document #
OPEI	0675

Our Response:

The regulations specify that maximum engine power is used only for determining whether engines are subject to part 1054 requirements or not. Engines are tested based on the procedures specified in part 1054, subpart F (including Appendix II), which clarify the load settings for full-load operation during the emission test. There are no power definitions or specifications in §1065.601, but the other places where there are power specifications in part 1065 (such as engine mapping in §1065.510) do not apply for handheld engines.

2.5.3 Maximum test speed

What Commenters Said:

OPEI agreed with the reasoning EPA presented for an improved basis in selecting an appropriate wide-open throttle speed for emission testing. OPEI believes though that EPA may be unnecessarily complicating the regulation with its current language. Handheld products such as chain saws, trimmers, brushcutters, edger and hedge clippers (not inclusive) run at wide-open throttle speeds in the field that may vary depending on application and load. For example a chain saw may be used for debranching, bucking or felling. All which may have slightly different loads and resulting speeds. It can be said that these product types will always be operating around the max power point but this could vary by several hundred rpm.

Product that always operates at a fixed speed due to the load of the transmission device (like a power blower, pump or generator) should always be tested at the actual operating speed in field conditions to get the best real world emission test results. OPEI suggested that the definition for rated speed at wide-open-throttle for handheld products be revised as follows: 1) Products that always operate at a fixed speed due to the natural load placed on the engine (such as power blowers and pumps) should be tested at the real world operating speed, in the

configuration intended for use by the manufacturer, (+/- 350 rpm). 2) For all other handheld products (like clippers, trimmers chain saws, edgers etc), the emission test at wide-open throttle should be performed at the point of peak engine power (+/- 350 rpm).

EMA commented on two of the definitions set forth in §1054.801: 1) Maximum test speed: The reference should not be to 40 CFR Part 1065.1001, but rather to 40 CFR Part 1054.505. 2) Maximum test torque: The reference should not be 40 CFR Part 1065.1001, but rather to 40 CFR Part 1054.505.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691

Our Response:

We believe ungoverned handheld engines should be tested at speeds representing the most likely in-use operating speed. We agree with OPEI's suggested approach for identifying the nominal test speed for engines based on whether or not they will be operating in a fixed-speed application.

We use the term "maximum test speed" in part 1054 only to describe how to test governed handheld engines over the two-mode handheld duty cycle. We believe this broadly applicable method from part 1065 is appropriate for testing these engines and are therefore retaining the definition as proposed.

We have revised the regulation to avoid using the term "maximum test torque," since the meaning of this term from part 1065 does not apply to Small SI engines.

2.5.4 Test fuel

What Commenters Said:

OPEI, EMA and Briggs and Stratton commented that California Phase 2 Certification fuel should be allowed with EPA approved adjustment factors for Phase 2 nonhandheld engines as currently practiced for Phase 2 engines. Specifically, OPEI commented that the statement in §1054.501(b)(2) should be revised to reflect: "use commercially available fuel representative of the fuel that in-use engines would use in the same environmental conditions as the test is conducted. Use of CARB Phase 2 fuel is considered acceptable." EMA commented on §1054.501(b)(2) "How do I run a valid emission test?" EPA should explicitly state that California Phase 2 Certification fuel may be used with EPA approved adjustment factors as currently practiced for Phase 2 engines. Briggs and Stratton added that the proposal does not allow for the use of oxygenated fuel, which would include California Phase 2 Certification fuel. Alternative test fuels should continue to be allowed. Requiring a change would impose a burden on many engine manufacturers with no benefit.

OPEI's and EMA's engine manufacturers proposed that appropriate correction factors be developed if the EPA certification test fuel is changed to an oxygenated fuel. Currently EPA allows an option for engine manufacturers to use California certification test fuel which is an oxygenated fuel for exhaust emission testing with an appropriate adjustment factor for the emission results reported. OPEI's engine manufacturers recommended that a standard adjustment factor for 50 state correlation (CARB/EPA) be included in the final regulation. EMA added that the emission adjustment factors should be defined either in the regulatory text or in guidance such that all manufacturers can utilize the same approved adjustments.

With regard to handheld engines, OPEI also supported alignment of EPA certification fuel with the California certification fuel because the type of fuel may directly influence the results of any testing and the ability of manufacturers to confirm that technologies evaluated are in fact compliant with the proposed regulations. However, the means to achieve this alignment needs to be flexible. OPEI proposed allowing the use of CARB certification fuel for handheld engine exhaust emission testing without the need for correlation factors. OPEI requested that different approaches to the solution should be considered for 2-stroke and 4-stroke engines since the emissions are different.

OPEI commented that EPA should harmonize the fuel for exhaust and evaporative emission testing because the same fuel can represent real world conditions in the field. EPA should accept a ten percent ethanol blend fuel as the standard test fuel for engines without changing the limits. If a manufacturer certifies with the ten percent ethanol blend fuel, OPEI commented that EPA should use the same fuel for any SEA or in-use testing conducted.

Letters:

Commenter	Document #
OPEI	0675
Briggs and Stratton	0657
EMA	0691

Our Response:

We are requiring Phase 3 exhaust emission testing with a standard test fuel consistent with the existing requirements under 40 CFR part 90 (see 40 CFR part 1065, subpart H). The existing regulatory specifications allow for no oxygenates in the test fuel. Because CARB specifies a test fuel which contains the oxygenate MTBE (but also allows for the use of EPA's test fuel), we understand that some engine manufacturers will have emissions data from engines which meet EPA's Phase 3 standards based on testing to meet California's Tier 3 Small Off-Road Engine requirements for 2007 and later model years. In some cases this test data will be based on California's oxygenated test fuel, although manufacturers have the option to certify using a test fuel such as that specified by EPA in 40 CFR Part 90. To allow for a quicker transition to the new EPA standards, we will allow for use of this pre-existing exhaust emission test data (based on California's oxygenated test fuel) for EPA certification purposes through the 2012 model year (see §1054.145(k)). Manufacturers could also use the CARB test fuel for their PLT testing, if they based their certification on that fuel. The use of the CARB data would be subject to the provisions for carryover data for demonstrating compliance with the standards in effect. (The carryover provisions for Phase 3 are specified in §1054.235(d) of the regulations.)

While we will allow use of this CARB data for certification through the 2012 model year, we will use our test fuel without oxygenates for all confirmatory testing we perform for exhaust emissions. We are limiting the timeframe for such a provision because we ultimately want the exhaust emission test results to be on the EPA specified test fuel.

After the 2012 model year, a manufacturer wanting to use the CARB test fuel for certification purposes could request use of the CARB test fuel under the provisions of 40 CFR 1065.701(b) which apply for alternate fuel specifications. As part of that request, the manufacturer is required to show that use of the alternate test fuel will not affect the ability to demonstrate compliance with all applicable emission standards. We would expect this showing should be straightforward for handheld engines, where we are not changing the exhaust emission standards for Phase 3 and where many manufacturers are already using CARB test fuel and should already be taking any emissions difference into account when certifying their engines. For nonhandheld engines, where we are changing the exhaust standards for Phase 3, we would expect to see emissions data showing the impact of the alternate fuel on emissions (compared to EPA's standard test fuel) as part of the manufacturer's request to use an alternate fuel under 40 CFR 1065.701(b). While we may allow use of alternate test fuels such as the CARB test fuel after the 2012 model year, we will use our test fuel without oxygenates for all confirmatory testing we perform for exhaust emissions. Furthermore, because of the differences in engine technologies, we do not believe it is appropriate for us to establish an "adjustment factor" for CARB certification fuel or any other potential alternate fuel. Each manufacturer would need to determine the emissions impact of the alternate fuel for its specific engine designs.

In the proposal we noted our concerns about testing with oxygenated fuels since this could affect an engine's air-fuel ratio, which in turn could affect the engine's combustion and emission characteristics. Because of the relatively recent dramatic increase in the use of ethanol (another oxygenate) in the broad motor gasoline pool, we have reexamined our position (as discussed below) and are adopting provisions that will allow manufacturers to use a 10 percent ethanol blend for certification testing for exhaust emissions from nonhandheld engines, as an alternative to the standard test fuel. This option to use a 10 percent ethanol blend will begin with the implementation date of the Phase 3 exhaust standards. The option would apply to production-line testing as well if the manufacturer based their certification on the 10 percent ethanol blend. We are also committing to using a 10 percent ethanol blend for all confirmatory testing we perform for exhaust emissions under the provisions described below.

Ethanol has been blended into in-use gasoline for many years, and until as recently as 2005, was used in less than one-third of the national gasoline pool. However, ethanol use has been increasing in recent years and, under provisions of the Energy Independence and Security Act of 2007, ethanol will be required in significantly greater quantities. We project that potentially 80 percent of the national gasoline pool will contain ethanol by 2010, making ethanol blends up to 10 percent the de facto in-use fuel. As ethanol blends become the primary in-use fuel, we believe it makes sense for manufacturers to optimize their engine designs with regard to emissions, performance, and durability on such a fuel. We also believe manufacturers need to know that any confirmatory testing we do on their engines will be performed on the same fuel the manufacturer used for certification since the fuel can impact the ability to demonstrate compliance with the emission standards.

Limited data of nonhandheld engine emissions tested on 10 percent ethanol blends suggests the HC emissions will decrease and NOx emissions will increase compared to emissions from the same engine operated on current certification fuel without oxygenates. Depending on the relative HC and NOx levels of the engines, these offsetting effects can result in small increases or decreases in total HC+NOx emission levels. Because the impact on HC+NOx emissions can vary slightly from engine family to engine family, we do not want manufacturers varying their certification fuel from one family to another to gain advantage with regard to emissions certification.

Therefore, if a manufacturer wishes to use a 10 percent ethanol blend for certification, we are adopting provisions that require manufacturers to use the 10 percent ethanol blend for all of their Phase 3 nonhandheld engines for a given engine class within three years of the Phase 3 standard taking effect (i.e., by the 2014 model year for Class I engines and by the 2013 model year for Class II engines). During the transition period, we will perform any confirmatory testing on the 10 percent ethanol blend if that is the fuel used by the manufacturer for certification. At the end of the transition period, we will perform any confirmatory testing on the 10 percent ethanol blend if that is the fuel used by the manufacturer for certification, but only if the manufacturer has certified all of their nonhandheld engines in that engine class on the 10 percent ethanol blend. If the manufacturer has not certified all of its engines in a given engine class on the 10 percent ethanol blend, we could decide to test the engine on our current test fuel without oxygenates.

For handheld engines, where we do not have sufficient data on the impact of ethanol blends on emissions, we are adopting a slightly different approach. Manufacturers will have the option to use a 10 percent ethanol blend for certification beginning with the 2010 model year. The option to use a 10 percent ethanol blend would apply to PLT testing as well if the manufacturer based their certification on the 10 percent ethanol blend. While we will allow use of a 10 percent ethanol blend for certification, we expect to use our test fuel without oxygenates for all confirmatory testing for exhaust emissions. Therefore, an engine manufacturer will want to consider the impacts of ethanol on emissions in evaluating the compliance margin for the standard, or in setting the FEL for the engine family if it is participating in the ABT program. We could decide at our own discretion to do exhaust emissions testing using a 10 percent ethanol blend if the manufacturer certified on that fuel. It can be noted that both EPA and CARB are currently running test programs to look at the emission impacts of a 10 percent ethanol blend on a range of small SI engines, including handheld engines. Based on the results of that test program, we may want to consider changes to the provisions allowing the use of a 10 percent ethanol blend for certification and PLT testing for handheld engines. If the results of the handheld engine testing show that emissions are comparable on both fuels, we would expect to revise the provisions for handheld engines and adopt similar requirements to those adopted for nonhandheld engines as noted above.

The test fuel specifications for the 10 percent ethanol blend are based on using the current gasoline test fuel and adding fuel-grade ethanol until the blended fuel contains 10 percent ethanol by volume. It should be noted that this is the first time EPA regulations specify the use of an ethanol test fuel for exhaust emissions testing for certification purposes. It is likely that EPA will consider similar test fuel changes in the future for other vehicle and engine categories including those addressed in this final rule. As part of those deliberations, it is possible that EPA

could decide that the test fuel specifications for the ethanol blend should be different than those adopted in this rule. Should that occur, EPA would need to consider whether changes to the test fuel specifications adopted in this rule for the 10 percent ethanol blend are appropriate for nonhandheld engine testing.

2.5.5 1065 Issues for Small SI Engines

Comments were received from industry and industry organizations on several issues relating to the application of Part 1065 to Small SI engines. This section describes issues that are specific to Small SI engines. See Section 1.4 for more general issues raised by commenters related to engine testing under Part 1065.

What Commenters Said:

In the proposal and in its administrative record, EPA has not clearly identified, much less evaluated, all the potential impacts that could occur by replacing the Part 90 exhaust emission test procedures for small-spark-ignited engines with the generic Part 1065 exhaust emission test procedures. The 1065 test procedures were developed for very different types of much larger and more sophisticated engines. OPEI stated that its members are committed to working with EPA to fill the critical data gaps. However, there is no way EPA or industry could generate all the needed information in the next few months, complete this evaluation, and make all the needed improvements – before the final Phase 3 rulemaking must be issued. For these reasons (which are discussed in more detail below), EPA should allow (on a permanent basis) small engine exhaust testing at facilities that use equipment and procedures that are compliant with the existing Part 90 equipment, procedures and calculations.

1. Equation Calculations: Kohler, B&S and OPEI stated that Part 1065 should not be implemented until correlation between Part 90 and Part 1065 (subsection G) calculations have been adequately demonstrated (documented, correlates and validates). Before eliminating or making any changes to the well-established Part 90 test procedures, EPA should first conduct comparative testing, and identify and analyze all the impacts of shifting to Part 1065. Industry has developed a database of information with part 90 over the past 10 years. The proposed changes to calculate emissions on Part 1065 are confusing and jumbled. Simple spreadsheet calculation methods are now impossible and a program dedicated to an iterative solution is required. There is no data in the record to show the proposed test method would yield the same results. If the correlations are not completed, the manufacturers of Small SI engines must be allowed to continue to use the 40 CFR Part 90 calculation methods.

   Specifically, OPEI stated that virtually all small SI engines operate richer than stoichiometry and the majority of testing is conducted using raw gas sampling methods. Consequently, the applicability of the equations for raw gas emission measurement for engines with air/fuel ratios richer than stoichiometric are critical. Part 1065 prescribes equations associated with the conversion of the raw analyzer measurements to the mass equivalent. Much more measured data (like H2O, N2O, aldehydes) would be needed to prove the equivalence of the 1065 calculation on a theoretical (mass balance of O, C, N,

H) and practical bases. Differences in exhaust sampling systems may affect these chemical reactions/equilibrium and thereby the exhaust gas composition and measured values. It is a well known effect that hydrocarbons are converted to CO at high temperatures (post catalyst). Probes, sampling location, temperatures and flow rates all have a potential effect to change the measured values within a raw gas measurement.

2. Test fuels: In addition, the test fuel specifications in Part 1065 are different than existing Part 90 fuel specifications which could also result in skewed, different reported emissions. Part 1065 does not include any specification that addresses the 2-stroke oil-grade and mixing ratio. (See 40 CFR S. 90.308). (OPEI)

   Test methods: Before eliminating Part 90 as an option for test equipment, EPA would first need to resolve numerous outstanding issues, make needed modifications, and document that Part 1065 requirements can be practically implemented with small engines.

3. Fuel flow meter issues: a) the accuracy prescribed by §1065.205 may be impossible to meet for small engine test cells. Current known instruments will nominally meet the 2% accuracy and 1% repeatability values specified in Part 90, but may not meet the percentage of maximum or the percentage of point requirements specified in Table 1 of 1065.205. b) Linearity verification for fuel flow rates ≤1% (under §1065.307) are not feasible for small engines with low fuel flow rates. c) Lastly, a concern expressed was that the wide open fuel flows of today's Part 1065 engines may reach as much as 50 liter/hour whereas Small SI engines frequently do not exceed 0.5 liters/hour. (Industyr representatives later indicated that these points were meant to raise the issue that the tolerances in these sections are not yet known to be achievable.)

4. The requirement to control torque as needed to meet 40 CFR Part 1065.514 cycle-validation criteria may not be feasible for test modes with very low target set points. Currently, 40 CFR Part 90.410 includes a provision for Phase II testing that reads as follows: "hold the specified load within the larger range provided by ±0.27 Nm (±0.2 lb-ft), or ±ten (10) percent of point" for current Phase 2 engine testing. EPA must include a similar provision applicable to the testing of engines with modes where torque set points result in impractical cycle validation, as prescribed by §1065.514. (EMA) The comments also stated a concern that the torque transducers called for in Part 1065 today would measure up to hundreds of joules of torque whereas the transducer used for engines specified in Part 90 measure in the range of tenths of joules. The characteristic of these engines requires a transducer to handle high torque spikes yet, measure smaller torque ranges once the engine stabilizes. (OPEI)

5. Part 1065 analyzers which are designed for larger engine emission measurements might not be practical or suitable for long-term emission measurements on small SI engines – at least without substantial modifications. For example, the HC hang-up specifications (2 ppm) in S. 1065.520 are impractical for the much higher HC emission concentrations measured on rich burn gasoline sampling raw gas concentrations.

6. The ambient conditions defined by 40 CFR Part 1065.520 are different than the conditions prescribed by §1054.115(c). Specifically, the ambient pressure range specified in §1065.520 is a range from 80.0-103.325 kPa; and the pressure range specified in §1054.115(c) is 94.0-103.325 kPa. The Part 1065 ambient condition requirements should be clarified in order to provide that the general requirements prescribed in Part 1065 are pre-empted by the standard setting Part. (EMA)

7. The NPRM does not allow exhaust emission test results to be adjusted in order to account for the effect of ambient humidity. However, NOx emissions test data is currently corrected for humidity pursuant to 40 CFR Part 90.419. Because many laboratories do not have the ability to run at controlled humidity (as EPA can), such corrections are often significant. The final regulation must allow the correction of emission test results for humidity as currently prescribed by § 90.419 (and utilized by CARB). (EMA)

OTHER:

8. Based on the limited information that EPA has provided, it is difficult for OPEI to comment on all the ramifications of this proposed change. However, it appears that the Part 1065 test procedures could cause small engine manufacturers to spend hundreds of thousands of dollars on at least new calibrations and software with no environmental benefits. The cost estimate of equipment upgrades will be as much as $500,000 per test cell with no real benefit to emissions. (OPEI)

9. EPA has also not identified how a shift to the Part 1065 test procedures would impact small engine manufacturers in terms of replacing or modifying their existing Part 90-compliant test equipment and related software and calibrations.

10. Manufacturers noted that some manufacturers control engines at idle by setting the dynamometer to control engine speed and use operator demand to control torque (usually zero, but not always), while other manufacturers take the opposite approach.

11. Given numerous uncertainties, the application of Part 1065 could result in more stringent exhaust standards. At least for handheld manufacturers, the Part 1065 test procedures could also unintentionally result in more stringent exhaust standards. To avoid these unintended consequences, EPA should allow small engine manufacturers to continue to rely on the Part 90 test procedures, which could simply be referenced in the new Part 1065. (OPEI) In its Phase 3 proposal, EPA repeatedly indicated it would not change the stringency of the Phase 2, exhaust standards for Handheld (HH) products. The Phase II exhaust standards for HH engines are exclusively based on data generated from Part 90 test equipment. EPA's proposal and supporting administrative record do not evaluate whether, or to what extent, the application of the Part 1065 requirements and calculations could generate higher reported emissions from small engines (compared to Part 90) – unintentionally resulting in more stringent standards than are supported by EPA's record.

12. The requirement to submit a written report explaining reasons for invalidating any test and the need for EPA to authorize retesting is overly broad and requires clarification.

There is no need for EPA to authorize common causes for clearly invalid tests, such as invalid pre- or post- span measurements, etc. The requirement to submit the test result from an invalid test is acceptable provided EPA recognizes that in some cases the reason that the test is invalid will result in erroneous results that should not be used for any purpose. (EMA)

13. OPEI stated some members have recently purchased Part 1065-compliant analyzers and equipment in other industry segments based on their reliance on EPA's proposal that they would be able (as an option) to start certifying products with this equipment immediately. OPEI supports EPA's proposed approach to allow (as an option) certification testing using Part 1065-compliant equipment.

14. TIMING: At this stage in the rulemaking, there is inadequate time and resources for EPA and the affected stakeholders (including test equipment suppliers) to gather the needed information and then to develop proposed tailored solutions and regulatory modification to address all the unresolved issues. There is no way EPA could issue a final regulation in June 2008 that would address all these problems with the needed modifications for small engines.

15. Part 1065 Test Procedures would Create Discriminatory Trade Barriers

The U.S. EPA proposed test equipment changes would contradict the agreed-to goals of standards-harmonization and, in certain circumstances, could create a barrier to trade. CARB and the EU emissions regulations for small engines are based on the Part 90 procedures. As indicated in CARB comments into EPA's Phase III rulemaking, CARB may not accept certification data from Part 1065 test equipment for small engines. CARB remains concerned that Part 1065 equipment will not generate the same results as Part 90 test equipment for small engines. In a call on January 23, 2008, CARB's certification office confirmed that CARB will not generically accept certification test data on small engines based on Part 1065 test results because of the absence of any existing database that generically documents the equivalency of Part 1065 and Part 90 test procedures as applied to small engines. Consequently, CARB will require individual manufacturers to demonstrate complete and identical test equivalency on their proposed test equipment through a comprehensive CARB-approved test plan. To our knowledge, no small engine manufacturer has made such a demonstration to CARB's satisfaction. We expect other jurisdictions, including the EU, to adopt a similar position and refuse to accept Part 1065 test results for small engine certification in the absence of a comprehensive demonstration of equivalency. Such demonstrations will be very difficult to prove. Even after expending substantial resources to try and establish such an equivalency, it is uncertain whether individual manufacturers' test equipment will meet CARB's and the EU's requirements.

Other major countries, including China, are developing regulations that are primarily based on the EU regulations and the related Part 90 testing procedures. EPA's proposed, unilateral changes to these test procedures would force at least European and Asian small engine manufacturers (that need to produce uniform products for the global market) to spend millions of dollars to purchase, install and calibrate separate analyzers, software,

and instrumentation (and invest in additional personnel) to re-test dozens of different, emission-compliant, engine families that are exported to the U.S. market.

A disproportionate cost burden would be born by smaller and mid-size European and Asian manufacturers that typically manufacture and certify small volume or "niche" products for the U.S. market. In fact, the higher per-unit costs of U.S. EPA certification-testing could bar small volume European and Asian producers from being able to compete and sell niche products in the U.S. market. For example, smaller manufacturers with only a few test cells would likely incur at least $300,000 in additional costs in modifying their test cells in order to test and certify (with EPA) their US products under the Part 1065 procedures. Assuming a 5-year amortization, this would result (on average) in $73,000 in additional testing costs per year. Many of the affected niche product lines produced by European and Asian manufacturers consist of only 1,000 units in U.S. sales each year. For such products, European and Asian manufacturers would incur additional, amortized testing costs in the range of $73 per unit for niche lawn and garden product lines that typically sell for less than $300 per unit. Thus, the U.S. EPA's proposed "Part 1065" test procedures could create discriminatory trade barriers that unfairly discriminate against the niche products and low-volume manufacturers and would require them to invest in expensive and redundant emission test equipment.

Euromot also stated that the changes in the test procedures as proposed by introducing §1065 would generate a misalignment with present equipment and worldwide harmonized procedures and would not generate additional value to the US customers. Euromot therefore asks EPA to stay with the current part 90 test procedures.

On March 19, 2008 Euromot sent a followup letter to their comments on the NPRM and stated that in the final Phase 3 rule, EPA should 1) continue to apply harmonized Part 90 Test procedures to small spark-ignited engines; and 2) Commit to initiate a process to develop Global Technical Regulation (GTR) with the coordinated participation of the EU and other international stakeholders (including Euromot) to develop new test procedures that are specifically tailored to the unique challenges of small spark ignition engines.

Stihl further emphasized their interest in cooperating with EPA in an effort to develop a Global Technical Regulation. They noted that Euromot's goal is a very precise test method that does not give flexibility towards "creative" test results, rather than leaving specifications that are too general to serve as a practical instruction for companies that may be inclined to cut corners in their testing efforts.

Letters:

Commenter	Document #
OPEI	0675
OPEI	0752
Euromot	0649
Euromot	0766
Kohler	0703
Briggs and Stratton	0657
EMA	0691
Stihl	0784

Our Responses:

Before addressing the specific comments, it is important to note that since the time of the NPRM, we have made changes to part 1065 in a separate rulemaking that also set new emission standards for locomotives and marine diesel engines (73 FR 37096, June 30, 2008). As described below, several of these changes address comments that we received on this rule.

1. *Equation Calculations – correlation needed, else allow manufacturers to use Part 90.*

Industry commented that correlation between Part 90 and Part 1065 calculations has not adequately been demonstrated for these classes of engines. EMA, B&S, OPEI, Kohler stated part 1065 not be implemented until it is shown 1065 and 90 are equivalent for raw gas measurements.

In response to comments, we have conducted a thorough comparison of the part 90 and part 1065 calculations.[1] Our initial analysis show small but significant differences between the two methods. Some of the initial differences are being eliminated through changes to the part 1065 equations as described below. Others that are the result of errors in the part 90 calculations are not being eliminated. Calculations from the modified part 1065 equations and from the part 90 equations for handheld engines are presented below. The table below shows the differences between the Part 90 and Part 1065 data sets with Part 1065 calculations yielding lower emission results for HC and overall HC+NOx. Existing data can be recalculated or adjusted to be comparable to part 1065 results.

[1] In January/February of 2008, EPA shared correlated data with the nonhandheld and handheld industries based on industry submitted data.

Percent difference between emissions calculated using part 90 versus part 1065 equations (Negative values indicate that values calculated according to 1065 are lower than those calculated according to 90.)				
	HH	HH	NHH	NHH
	Raw*	CVS	Test 1	Test 2**
HC	-2.51%	-2.78%	-2.19%	-2.28%
NOx	0.29%	-0.13%	0.41%	0.32%
CO	0.23%	0.28%	0.22%	0.21%

* Errors were found in the currently published Part 90 calculations and are being corrected with this final rulemaking.
** An error was found in the industry K_h calculation related to nonhandheld engines for Test #2; it was corrected and comparison to 1065 was based on the corrected numbers.

As part of the exercise to compare calculated emission results, we determined that it was necessary to account for free hydrogen in the exhaust as part of the carbon balance. This is particularly important for engines that run rich of stoichiometry because of the greater concentration of hydrogen formation with such engines. For engines that have already been subject to testing under Part 1065 using the old equations, calculating based on a zero concentration of hydrogen in the exhaust is a reasonable simplifying assumption. We have modified the Part 1065 equations in this rule to reflect the need to account for hydrogen in the exhaust for engines that run rich of stoichiometry. The hydrogen values can be calculated and need not be measured by an analyzer.

2. *Specifications for 2-stroke oil grade and mixing ratio will be considered. Specifications for test fuels will be evaluated and considered.*

In response to comments, EPA is adding 2-stroke oil grade and mixing ratio specification to part 1065 in subpart H. The new language is being taken from §90.308(a)(1), which states that the fuel/oil mixture ratio must be that which is recommended by the manufacturer for the 2-stroke engines.

3. *Fuel flow meter issues*

Regarding measurement of fuel flow rates, the equipment for measuring fuel flow rates so precisely may not currently be in use by all in industry. Currently part 90 states that test points are to come within, 2% at non-idle and 5% at idle of the reading. According to the 1065 requirements for the calibration of the fuel flow meter, the engine manufacturers must test 10 points over the range of fuel measurement expected during the entire test. The verification tests then apply to this linear line and calibrations of the system are to be done. For a handheld engine the certification test uses only two test points during its test and may use 0-6lb/hr for example. The two modes are at WOT and idle and therefore the in between points are never used. For a nonhandheld engine that used 0-3 lb/hr, a reading must be taken every 0.33 lb/hr and there are 6 modes in the certification test. Industry does not yet know if fuel flow measurement equipment is available to read to this degree and does not see the need for this precision for neither of these test procedures are transient.

EPA would like to ensure linearity of the fuel flow meter within the range of testing. This cannot be a simple two point verification, but needs to include enough points to insure linearity between the maximum and minimum fuel flow rates. This check only needs to be performed yearly; therefore EPA would like the small handheld engine manufacturers to perform the fuel flow meter linearity verification check as currently described in 1065.307.

One possible solution is to use gravimetric technology as long as the linearity specifications in 1065 are met.

Table 1: Comparison of Requirements for Fuel Flows

Fuel Flows	**Part 90**	**Part 1065**
Fuel flow meter specs	90.328: Measurement equipment accuracy/calibration frequency table. Table 2: Permissible deviation from reading: fuel consumption: +/-2% at non-idle +/-5% idle	(Recommendation) : Table 1 of 1065.205 5 sec rise and fall time 1Hz Accuracy: 2% of pt/1.5% of max Max repeatability: 1% pt/.75% max Noise .5%
Linear Verification	None…	Linear verification 1065.307 - 10 measurement points covering range of test meas. - least squares linear regression and the linearity criteria specified in Table 1 of this section.
Calibration and verify		1065.320
Frequency of Calibration	Calibrate monthly or within one month prior to the certification test.	Measurement systems that require linearity verifications … Torque and Fuel Flow: Within 370 days before testing

4. Torque related issues

As industry works with 1065 over the coming years, we expect to work with industry to understand how to properly measure torque. In particular, we believe it is possible to use equipment meeting the torque requirements for testing Small SI engines, even at the low torque levels that are typical for these engines. We have modified the cycle-validation criteria for torque as described in Section 2.5.7 to more carefully reflect the level of precision that is appropriate for Small SI engines.

EPA would like to ensure linearity of the torque meter within the range of testing. This cannot be a simple two point verification, but needs to include enough points to insure linearity between the maximum and minimum torque values. This check only needs to be performed yearly; therefore EPA would like the small handheld engine manufacturers to perform the torque meter linearity verification check as currently described in §1065.307.

Table 2: Comparison of Requirements for Torque Transducers

Torque Transducers	**Part 90**	**Part 1065**
Calibration procedures	90.305 Dynamometer specifications and calibration accuracy … a minimum of **three** calibration weights for each range used is required. The weights must be equally spaced and traceable to within .5% of NIST weights. (foreign countries.. use wtd to local gov stds) 90.306 Dynamometer torque cell calibration Gives details on procedure	**§1065.307 Linearity verification.** (2) Engine torque. Use a series of calibration weights and a calibration lever arm to simulate engine torque. You may instead use the engine or dynamometer itself to generate a nominal torque that is measured by a reference load cell or proving ring in series with the torque-measurement system. In this case use the reference load cell measurement as the reference value. Refer to §1065.310 for a torque-calibration procedure similar to the linearity verification in this section. 1065.310: … Apply at least **six** calibration-weight combinations for each applicable torque-measuring range, spacing the weight quantities about equally over the range.
Calibration accuracy	90.306 dynamometer torque cell calibration Meas torque must be within 2% of calculated torque	Table 1 of §1065.307–Measurement systems that require linearity verifications.. specifications given for linearity
Calibration frequency	90.328 Measurement equipment accuracy/calibration frequency table. Torque: monthly or within one month prior to the certification test	Table 1 of §1065.307– Linearity for system (fuel flow rate and engine torque) – every 370 days 1065.310 Torque calibration. Calibrate all torque-measurement systems including dynamometer torque measurement transducers and systems upon initial installation and after major maintenance. Use good engineering judgment to repeat the calibration.

5.…The HC hang-up specifications (2 ppm) in S. 1065.520 are impractical for the much higher HC emission concentrations measured on rich burn gasoline sampling raw gas concentrations.

This language was changed in the locomotive/marine 2008 final rulemaking to address this concern.

6. The Part 1065 ambient condition requirements should be clarified in order to provide that the general requirements prescribed in Part 1065 are pre-empted by the standard setting Part. (EMA)

Section 1065.5 states "The testing specifications in the standard-setting part may differ from the specifications in this part. In cases where it is not possible to comply with both the standard-setting part and this part, you must comply with the specifications in the standard setting part. The standard-setting part may also allow you to deviate from the procedures of this part for other reasons." Thus the regulations are already clear in this respect.

7. EPA needs to allow for correction of ambient humidity 90.419 (also used by CARB). Industry does not have humidity controlled test cells.

Parts 1045 and 1054 are being revised to allow the correction of NOx for humidity. Equation 1065.670-1 calculates the correction. The 2006 version of Part 90 also refers to the same equation so there is no change in this calculation.

8. Based on the limited information that EPA has provided, it is difficult for OPEI to comment on all the ramifications of this proposed change. However, it appears that the Part 1065 test procedures could cause small engine manufacturers to spend hundreds of thousands of dollars on at least new calibrations and software with no environmental benefits. The cost estimate of equipment upgrades will be as much as $500,000 per test cell with no real benefit to emissions. (OPEI)

We disagree with the estimated cost and the supposition that upgrading to part 1065 will have no benefits. As described in the RIA, we believe that a typical manufacturer will need to spend much less than this to upgrade its test facilities to be part 1065 compliant. To the extent that any manufacturer needs to spend more, it will be because they are currently using outdated equipment that is not sufficiently accurate, precise, and/or reliable to demonstrate compliance with EPA standards. Clearly having more accurate and repeatable measurements is beneficial.

9. EPA has not identified how a shift to the Part 1065 test procedures would impact small engine manufacturers in terms of replacing or modifying their existing Part 90-compliant test equipment and related software and calibrations.

Industry does not have to certify with part 1065 procedures until 2013 and therefore time is available to meet with EPA on specific questions related to part 1065 compliance. With proper planning, industry can plan out any changes over time.

10. Testing at idle

We agree that manufacturers should be able to choose whether to use the dynamometer or operator demand to control speed and torque during idle operation. We understand that in some cases, once the engine is stable and the dynamometer controls are functioning, engines may be tested in a configuration such that the engine operates at the specified speed or torque level without adjustment.

11. Part 1065 could result in more stringent exhaust standards

The nonhandheld industry provided EPA with emission test data from two engine tests using raw emission measurement. The handheld industry provided EPA with one raw emission dataset and one CVS emission dataset. EPA verified industry's Part 90 calculations and then used the data to calculate results using 1065 calculations. In each case, the numbers correlated between Part 1065 and Part 90 within -2.3% of HC on nonhandheld test data and -2.78% HC on the handheld raw test data. In each case the 1065 calculations yielded lower numbers for the

pollutant of THC due to the use of Part 1065's molecular weight of hydrocarbon default number rather than calculating it as was done in Part 90. The slight percentage decrease in effect yields slightly more lenient exhaust standards for the four datasets used in this analysis. Changes of up to 0.41% for NOx and 0.21 to 0.28% for CO are slightly more stringent standards for these pollutants in these examples.

The changes of <0.41% for NOx and <0.28% for CO on handheld and nonhandheld engines are very small changes. The NOx levels are very small on hh engines (test data showed 0.4%-0.8% of HC+NOx is NOx) and the emission standard for HC+NOx is either 50 g/kWhr or 72 g/kWhr, for Classes III, IV and Class V respectively. Therefore there is only a very slight increase in stringency in the standard. The handheld industry test results showed CO between 400 and 500 g/kWhr on the two sets of data for handheld engines. A 0.28% difference would mean an addition of approximately 1.12-1.4 g/kWhr. For nonhandheld engines, the overall change in HC+NOx was -1.7% and -1.6% for the two tests with the decrease in HC and the increase in NOx combined. For CO, test data shows the nonhandheld engines at 374 and 390 g/kWhr and 0.28% of these values are 1.05 and 1.09 respectively. This again is only a very slight increase.

12. The requirement to submit a written report explaining reasons for invalidating any test and the need for EPA to authorize retesting is overly broad and requires clarification. There is no need for EPA to authorize common causes for clearly invalid tests, such as invalid pre- or post-span measurements, etc. The requirement to submit the test result from an invalid test is acceptable provided EPA recognizes that in some cases the reason that the test is invalid will result in erroneous results that should not be used for any purpose.(EMA)

We agree that preapproval to retest after an invalid test is not necessary in most cases. However, it is necessary for invalid test results to be reported along with an explanation of why a test was invalidated. The revised regulations are also clear that we reserve the right to require preapproval of using retest results in PLT calculations should we determine that a manufacturer is inappropriately invalidating tests.

13. OPEI supports EPA allowing immediate certification with part 1065 compliant equipment.

Part 1065 allows for the early use of these procedures consistent with good engineering judgment.

14. Inadequate time and resources for EPA and the affected stakeholders to gather needed information and present tailored solutions and regulatory modification to address all unresolved issues.

The industry is not required to use part 1065 until 2013, which will allow over 4 years from the time of the final rule to modify the procedures. Also, the regulations in part 1065 include numerous provisions to provide manufacturers to use equivalent procedures. Thus we do not anticipate any problems associated with the timing of this requirement.

15. Part 1065 Test Procedures would Create Discriminatory Trade Barriers

In regards to the concern that CARB will not accept 1065 based certifications: CARB has been informed of Part 1065 along the way and will be adopting 1065 test procedures for small spark ignition engines.

Regarding the European Union adoption of 1065 procedures for small SI engines: it is likely that industry will begin proceedings for a GTR for small SI engines which will address 1065 requirements versus "may" options. The European community has already adopted 1065 for diesel engines.

Euromot stated that:"The changes in the test procedures as proposed by introducing §1065 would generate a misalignment with present equipment and worldwide harmonized procedures and would not generate additional value to the US customers. We therefore ask EPA to stay with the current §90 test procedures."

EPA is moving to 1065 test procedures and is planning to take steps to work with the California Air Resources Board. EPA has also begun talks with industry representatives to discuss any issues related to testing small SI engines per part 1065. Part 90 is somewhat vague in several areas relating to emission testing procedure. Part 1065 provides guidance in those areas.

Euromot requested that EPA commit to initiate a process to develop Global Technical Regulation (GTR) with the coordinated participation of the EU and other international stakeholders (including Euromot) to develop new test procedures that are specifically tailored to the unique challenges of small spark-ignited engines.

EPA will continue to interact with manufacturers on issues that arise in complying with part 1065 as they work toward making any necessary changes to comply with the new test procedures starting with the 2013 model year. Given that the test procedures in part 1065 have been demonstrated to be complete and consistent with the existing procedures in part 90, EPA believes it is not necessary to initiate a Global Technical Regulation at this point. However, if there is an international or other forum for exploring testing issues for Small SI engines, EPA would expect to participate in that effort.

2.5.6 Running loss simulation during exhaust test

What Commenters Said:

OPEI commented that the influence of running loss vapor on exhaust emissions is insignificant and should not be associated with the exhaust emission testing requirement. It is impractical for an engine manufacturer to exhaust emission test engines that are installed in a wide variety of equipment that include a wide variety of fuel tank sizes and running loss vapor generation characteristics. (EMA) The proposal's requirement that running loss controls be included when conducting exhaust emission tests is not practical. Emission tests are conducted in engine emission dynamometer test cells that include fuel delivery systems and do not generally include engine mounted fuel delivery systems. A given engine family may be utilized with a large variety of fuel tank configurations, some of which will be supplied by the engine manufacturer and some of which will be supplied by OEM customers. In addition, the inclusion of the running loss control system may significantly compromise the ability to comply with the

requirements for running the exhaust emission test - i.e., measurement of fuel flow for raw gas testing. Accordingly, this requirement should be eliminated.

EMA commented on §1054.501(b)(6) "How do I run a valid emission test?" This requirement is not practical for emission testing. Exhaust emission tests are conducted in engine emission dynamometer test cells that include fuel delivery systems and do not typically include engine mounted fuel delivery systems. A given engine family may be utilized with a large variety of fuel tank configurations, some of which will be supplied by the engine manufacturer and some of which will be supplied by OEM customers. Accordingly, this section should only include the first sentence, and the remainder of the section should be deleted.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691

Our Response:

As described in Chapter 5 of the Regulatory Impact Analysis, we measured in-use fuel temperatures and corresponding emission rates to quantify running loss emissions from various types of equipment. In some cases, measured temperature increases and emission rates were small. However, we noted that some equipment had fuel tanks positioned closer to the engine or other heat sources such that they experienced significant fuel heating. One case involved a 24°C temperature rise, which corresponded to a 69.3 g/hour emission rate. Total fuel consumption for a Class I engine might be about 300 g/hour (220 g/kW-hr with a 3 kW engine operating at 50 percent load). In this case, the engine would be ingesting 25 percent more fuel than it was designed for. The engine's emission controls would clearly not be able to compensate for this unmetered vapor load. Class II engines have higher fuel flow rates, but a similar assessment shows that a 12 kW engine would be ingesting about 6 percent more fuel than it was designed for. Even this smaller deviation would likely cause an engine without feedback controls to exceed emission standards.

Measuring emissions from an engine for which the onboard fuel tank supplies the fuel, including any running loss vapors routed to the intake, is not difficult with dilute-sampling equipment. We understand that this is much more difficult with raw sampling, and that individual labs may have some safety-related or other restrictions that make it impractical to do this testing. As a result, we are keeping the specification to include ingestion of actual or simulated running-loss vapors in the engine's intake during exhaust testing, but we are adding an allowance for manufacturers to make an engineering evaluation to show that actual vapor loads from in-use engines will not cause the engine to exceed the emission standard (or FEL if applicable). This would preserve the motivation for engine and equipment manufacturers to minimize the heat load on fuel tanks and to account for any remaining effect in establishing their compliance margins. We would expect any EPA measurement of exhaust emissions to include running-loss vapor loads (representative of in-use operation) as much as possible. For engine-mounted tanks, we would expect to simply duplicate (or retain) this configuration for laboratory

operation. For remote-mounted tanks, we may measure fuel temperatures from in-use equipment to properly simulate the running-loss effects.

In cases where the engine manufacturer also designs the configuration and placement of the fuel tank, this exercise should be straightforward. We understand, however, that equipment designs may include a wide variety of configurations that are not all within the engine manufacturer's control. In these cases, we would expect engine manufacturers to do development testing with their engines to be able to understand the sensitivity and limits of their engines' compliance with exhaust emission standards as a function of running-loss vapor loads. For loose engine sales to equipment manufacturers that control fuel tank designs, we would expect engine manufacturers to specify in their installation instructions some appropriate limits on the extent of tank heating to prevent the engine from exceeding applicable emission standards. For example, engine manufacturers could directly specify a maximum vapor load (in grams per hour) for continuous operation in the final installation. The vapor load for a given operating condition would vary depending on the size of the tank. Engine manufacturers could therefore alternatively specify a table of values for maximum fuel-tank temperature rise for fuel tanks with a range of capacities. The specifications in these installation instructions would form the basis of the engine manufacturer's simulation or analysis to demonstrate that the engine will meet emission standards in the final installation. Engine manufacturers may need to select a higher Family Emission Limit to include a sufficient compliance margin to take running-loss effects into account.

2.5.7 Cycle-validation criteria

What Commenters Said:

EMA commented on §1065.514(f) Cycle-validation criteria. While statistical cycle validation makes sense for transient test methods, it is an unnecessary encumbrance to steady-state testing. The current method is to track minimum and maximum speeds and torques observed during the sampling period; test mode acceptance requires the extreme deviations from the desired set point to be less than a percentage of set point. If statistical steady state mode validation is required, the test control system will need to be revised, at considerable cost to the manufacturer with no resulting environmental benefit. Accordingly, statistical cycle validation should not be required for Small SI engines.

EMA commented that the requirement to control torque as needed to meet §1065.514 is not feasible for test modes with very low target set points. Currently, pursuant to §90.410 the torque control requirement for Phase 2 engine testing is "hold the specified load within the larger range provided by ±0.27 Nm (±0.2 lb-ft), or ±ten (10) percent of point". EMA commented that this section must include a similar provision for testing of engines where the required torque set points cannot use the cycle validation criteria required by §1065.514.

EMA commented further on cycle-validation criteria: While the prescribed cycle-validation criteria and statistical cycle validation is viable for transient test methods, it is an unnecessary encumbrance to steady state testing. Currently, engine manufacturers track the minimum and maximum speeds and torques observed during the sampling period, and the test

mode acceptance criteria require the extreme deviations from the desired set point to be less than a percentage of set point. No environmental benefit is achieved from the addition of statistical cycle validation criteria for steady-state testing, and it raises serious concerns for engine manufacturers. Accordingly, EMA recommends that these requirements be waived for Small SI engines.

In response to a draft version of regulatory text suggesting updated cycle-validation criteria for nonhandheld engines, EMA suggested that the language should be in part 1054, not in part 1065, since it should apply specifically for Small SI engines. EMA further suggested that any change to what is required under §90.410 today would raise significant concerns.

Letters:

Commenter	Document #
EMA	0807
EMA	0691

Our Response:

Specifying nominal test speeds and loads with no cycle-validation criteria is meaningless. Without some definition of acceptable deviation from the reference values, it would be impossible to invalidate a test no matter what speeds and loads the engine actually experienced. Manufacturers are testing with cycle-validation criteria today. These specifications provide a useful starting point for setting appropriate specifications.

The current requirements in part 90 specify that torque for Modes 1 through 3 stay within 5 percent of point. Torque for Modes 4 and 5 must stay within 0.27 Nm or within 10 percent of point, whichever is larger. This allows for very sloppy testing, especially for small engines. For an 85 cc engine with peak torque of 4.0 NM, the nominal torque setting for Modes 4 and 5 would be 1.0 and 0.4 Nm, respectively. Specifying these points as 0.4$\pm$0.27 Nm and 1.0$\pm$0.27 Nm means that any torque value between 0.13 and 1.27 Nm would be a valid test point except for the narrow range of 0.67 to 0.73 Nm. This effectively allows the manufacturer to pick the most favorable torque values for certification. Seen another way, this could be utilized for EPA testing as similar to not-to-exceed zones for specifying any test point around the nominal value. This is clearly not the intent of the specified parameters.

We believe an alternative approach is better for targeting the nominal torque values for very small engines and will not increase the burden for running a valid test. Specifically, we believe there should be separate parameters to address a tolerance for the range of measured values and a limit for the mean value over the sampling period. Setting a tolerance specification of $\pm$2 percent of point or $\pm$0.27 Nm, whichever is greater is consistent with the part 90 specifications, allowing for an achievable range of values for high-power and low-power modes. An additional specification to keep the mean torque value within of $\pm$1 percent of point or $\pm$0.12 Nm, whichever is greater, ensures that the manufacturer targets a true nominal value even if there is substantial fluctuation in torque values during the sampling period. This prevents a manufacturer from intentionally biasing torque values low or high to take advantage of the wide tolerances that are necessary to accommodate the very low power levels. Mean values are

inherently much more stable than instantaneous values, so achieving the narrower range of values for the calculated mean torque should also be very achievable with current engines and with current test equipment.

2.6 Production-line testing

Comment	Response
EMA and OPEI commented that emission tests are often invalidated because one of the requirements specified in the test procedures was not met. Such requirements could be anything from a span check, a test condition parameter out of range, or any number of criteria required to conduct a valid test. Accordingly, they commented manufacturers should not be required to explain the reasons and report the emissions results from all tests that have been invalidated. Reporting of all test results would only be appropriate if EPA specifically recognizes that data obtained from an invalid test can not be utilized to determine compliance. By default, the new test should become the official test results. In EPA Phase 1 and 2 as well as CARB, this degree of authorization is not required.	We agree that manufacturers should not need to get EPA approval before invalidating and repeating a test when a problem arises. However, we continue to be concerned that allowing manufacturers to omit reports of invalidated tests could result in manufacturers finding a way to invalidate a test based on the observation that the engine has failed or will fail to meet emission standards. We believe we can best address these competing concerns by requiring manufacturers to document their invalidated tests, including the reason for invalidating and any emission results that were recorded. The manufacturer could include an explanation describing why (or to what extent) the reported emission results from the invalidated test do not reflect the engine's actual performance. We believe the proposed regulatory text in §1054.305(g) properly balances these concerns.
OPEI commented that EPA Phase 2 and CARB all require that production line test reports be filed within 45 days of the end of the quarter instead of 30 days, as proposed in §1054.3145. EPA is now requesting a different time period. OPEI requested keeping harmonization with CARB (report due 45 calendar days within end of test period).	We agree that quarterly reports for production-line testing should be due 45 days after the end of each quarter, consistent with our approach under part 90.
EMA commented on §1054.301(f) "When must I test my production-line engines?" EMA commented that the reference to 40 CFR 1068.27 is redundant and should be deleted.	We agree that the reference to §1068.27 is not necessary and have removed it from the regulation.
EMA commented on §1054.301(b) "When must I test my production-line engines?" EMA noted that the referenced section (§1054.32fs5) does not exist. EMA believes that the correct reference is to §1054.325.	In regard to the reference to §1054.32fs5, we appreciate the comment and have revised the reference as recommended.
EMA commented on §1054.305(d) "How must I prepare and test my production-line engines?" EMA commented that the requirement to adjust parameters must be clearly limited to adjustable parameters as defined in §1054.115(b). In addition, EMA commented that adjustment of the idle speed outside of the adjustable range as defined in §1054.305(d)(1) is not appropriate. Manufacturers determine idle speed ranges and tolerances. Adjustments outside of the manufacturers recommended tolerance are not appropriate.	The proposed provision related to adjusting idle speed was derived from the current regulations at §90.508 where we describe adjustments needed to operate an engine until it has reached stabilized emission levels. The original specification may have been related to the technology used for engines in that time frame. In any case, we are not aware of any need for making idle adjustments as described in the proposal. This includes a review of the testing we performed to establish the feasibility of the Phase 3 emission standards. We have therefore removed this provision from the final rule.
ECO commented that EPA should allow small volume engine manufacturers to utilize the use of alternative testing methods (portable emissions analyzers) to demonstrate in-use field testing compliance for production units.	We agree that the regulations should allow for simpler measurement methods for production-line testing, as described in Section 1.3.4.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691
ECO	0712

2.7 Equipment-manufacturer flexibilities

2.7.1 Duration and extent of allowances

What Commenters Said:

OPEI commented that without the proposed equipment transition flexibility, the EPA Phase 3 program cannot be implemented without causing substantial and unnecessary injury to equipment manufacturers and to the market. Non-integrated OEMs producing outdoor power equipment must be able to stagger their complex and iterative-development and product evaluation process, for their most challenging catalyzed muffler configurations and for their difficult fuel tank technologies (such as roto-molding). OPEI commented that it supports the allowance of 30% of one year's production for large OEMs. OPEI also supports the proposed 4-year transition period of the 2011 through 2014 model years.

OPEI commented that it strongly objects to EPA's suggestion in the preamble that the proposed hardship relief measures in the Phase 3 regulation could somehow moot the independent need for the equipment-transitional flexibility program. Both proposed elements are critical to the industry and to the effective implementation of the final program.

In response to EPA's request for comments on whether the transition program for equipment manufacturers somehow moots the need for the proposed Delegated Assembly Program (or visa versa), OPEI commented that both programs are necessary and the two programs serve separate, distinct purposes. OPEI noted that EPA has failed to evaluate or quantify (in its administrative record or in its SBREFA process) the substantial economic damages that would result without either the proposed equipment flexibility or the Delegated Assembly provisions. OPEI commented that EPA's other off-road emission regulations explicitly recognize the separate and independent need for Delegated Assembly, equipment-transition flexibilities, and hardship relief. Consequently, it would be arbitrary for EPA to abruptly eliminate any one of these flexibilities for small engines. (Also included in Section 2.8.1)

EMA supported the proposed delegated assembly and equipment manufacturer flexibility provisions included in the NPRM. EMA commented that EPA must incorporate both of these programs into the final rule. If EPA were to adopt only the delegated assembly program and not the equipment manufacturer flexibility program (or visa versa), EMA commented that the functionality of the adopted program would be significantly impaired by the absence of the other program. (Also included in Section 2.8.1) The inclusion of aftertreatment systems into an equipment manufacturers' exhaust system requires a much broader set of changes than just

packaging the catalyst into an existing muffler. In many cases, the introduction of an exhaust system that includes a catalyst will require a complete redesign of the exhaust system and/or the equipment in order to provide the necessary space and heat management of the exhaust system. This required redesign of the exhaust system/equipment is an enormous burden to the manufacturer and will create a significant strain on its resources. Accordingly, EMA believes that the flexibility provisions are absolutely necessary and must be incorporated into the final rule in order to ensure that manufacturers have the ability and time required to complete the necessary redesign.

CARB commented that it believes the proposed transition program for equipment manufacturers is unnecessary since most equipment manufacturers are working together with their engine manufacturers to meet California's Tier 3 standards. The equipment manufacturers are already working together to address concerns regarding lead-time, coordination, and other aspects involved in meeting the standards. CARB also commented that the proposed eligibility requirements for the TPEM program (i.e., only those manufacturers that have primary responsibility for designing and manufacturing equipment and whose manufacturing procedures include installing engines in the equipment are eligible) make it difficult to determine and enforce which manufacturers would actually qualify for the program.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691
CARB	0682

Our Response:

In response to the comments that a TPEM program is not needed because of CARB's Tier 3 program, EPA continues to believe a TPEM program is necessary for the manufacturers of Class II equipment. While CARB's Tier 3 standards took effect in the model year 2008, the major engine manufacturers appear to be using ABT credits to certify to the standards since most of the engines certified with CARB in the Class II category have FELs above the Tier 3 standard of 8.0 g/kW-hr HC+NOx level. While it is not clear how long it will be before manufacturers redesign their Class II engines for California, it is likely that the engine manufacturers will not have a full set of engines redesigned until 2011 or later when EPA's Phase 3 standards take effect. Because equipment manufacturers may need to make changes to some equipment designs to accommodate the redesigned Class II engines, EPA believes a TPEM program will help to ensure the transition to the Phase 3 standards goes smoothly for equipment manufacturers. EPA believes the basic framework of the TPEM program which allows manufacturers to use Phase 2 engines over a four year period on up to 30% of their average Class II sales is appropriate and we are finalizing those levels in the final rule, as proposed.

EPA agrees with the comments that the TPEM program and hardship provisions are both needed for the Phase 3 program. The hardship provisions are intended to help manufacturers that are facing economic hardship as a result of not being able to comply with the new standards. The criteria for qualifying for hardship are set at a relatively high level, which would likely be

difficult for a manufacturer to demonstrate if they were having difficulty redesigning only a few of their equipment models. The TPEM program allows an equipment manufacturer to deal with the models which are difficult to redesign without having to demonstrate that the company would experience hardship without the relief. Therefore, EPA agrees that both the TPEM program and the hardship provisions are needed and is retaining both of them for the Phase 3 program.

EPA agrees with the comments that the TPEM program and the delegated assembly provisions are both needed for the Phase 3 program. The delegated assembly provisions allow manufacturers to independently source their exhaust systems based on the catalyst specifications determined by the engine manufacturer. However, the delegated assembly provisions will not ensure that an equipment manufacturer will be able to redesign all of their equipment models in time to accommodate a Phase 3 engine. Therefore, EPA agrees that both the TPEM program and the delegated assembly provisions are needed and is retaining them for the Phase 3 program.

EPA disagrees with the comment that the criteria used to qualify manufacturers for the TPEM program makes it difficult to determine who is eligible. The purpose of the eligibility criteria is to ensure that only those companies that truly manufacture equipment can participate in the program. We do not want companies that only import complete equipment or companies that only install engines into a pre-existing equipment chassis to be eligible for the program. EPA has made this clear in the regulations. If there is any question regarding a manufacturer's qualifications, EPA can request information from the manufacturer to determine if they actually are designing/manufacturing equipment and installing engines under the authority granted in Section 208 of the Clean Air Act. Section 208 (which applies to nonroad engines under section 213(d) of the Clean Air Act) describes the information collection requirements for manufacturers and states that manufacturers must provide information that EPA may reasonably require to determine whether manufacturers have acted in compliance with regulations. For this reason, EPA is retaining the eligibility criteria for equipment manufacturers in the final regulations.

2.7.2 Additional allowances for mid-sized companies

What Commenters Said:

OPEI commented that it supports the proposed mechanism to allow small and mid-sized OEMs to request up to a 70% production-based allowance (on a case-by-case basis).

NESCAUM commented that they oppose the various provisions for small and medium volume manufacturers of engines and equipment that extend the use of Phase 2 compliant land-based SI engines for several years beyond the initial introduction of Phase 3 engines. However, they would not oppose a program whereby small businesses may apply individually to EPA for limited temporary relief from specific requirements due to economic hardship or other circumstances beyond their control.

Letters:

Commenter	Document #
OPEI	0675
NESCAUM	0641

Our Response:

EPA is retaining the special TPEM provisions for small- and medium-sized companies in the final rule. EPA believes that such companies face a bigger challenge with regard to equipment redesign than large companies because the small- and medium-sized companies tend to have fewer resources (i.e., both staff and money) available to work on equipment redesign. Therefore, EPA believes it is appropriate to offer more flexibility to these companies under the TPEM program. For small-sized manufacturers (defined in the regulations as producing no more than 5,000 pieces of nonhandheld equipment per year), the extra flexibility is automatic and allows them to exempt a cumulative 200% over four years. For medium-sized companies (i.e., those producing between 5,000 and 50,000 units with Class II engines), the manufacturer can request up to an additional 70% allowances over the four years, but must provide a variety of information to EPA to justify its request.

In regard to the comment on relying on hardship requests instead of additional TPEM allowances for small- and medium-sized businesses, EPA does not believe that making a hardship provision the primary means for obtaining additional allowances would be workable for manufacturers or EPA. As noted above, smaller companies have limited resources to allocate to equipment redesign. Even though they may be small, many of these companies have a wide range of equipment offerings. EPA would rather see these businesses working on the equipment redesigns than pulling together information to request additional allowances from EPA. Plus, it potentially would place additional significant burden on EPA to review hardship applications, since there are over three hundred eligible small- and medium-sized equipment manufacturers. Therefore, EPA is retaining the TPEM provisions for small- and medium-sized businesses as proposed.

2.7.3 Reporting and recordkeeping

What Commenters Said:

OPEI commented that it supports the proposed EPA notification, recordkeeping and ongoing annual reporting requirements for equipment manufacturers – these proposed provisions should be more than adequate to protect the integrity of the program. Any additional requirements would be overly burdensome.

OPEI commented that it supports the proposed provision that would allow engine manufacturers to simply keep records showing their TPEM engines met the Phase 2 standards – rather than re-certifying those TPEM engines for the current model year.

EMA commented that it agrees it is not appropriate or necessary to certify Phase 2 compliant engines used in the equipment flexibility program. EMA commented that engine

manufacturers must be allowed to measure emissions prior to the catalyst, or with and without catalyst, during deterioration factor determination and certification emission testing being conducted for Phase 3 certification in order to generate the required data (i.e., data showing that the engine family, without aftertreatment, will comply with the Phase 2 standard) with the minimum amount of extra time and expense. Specifically, EMA commented that the provisions in §1054.625(j)(2) must allow the test data required by sub-paragraph (i) to be measured prior to the catalyst as part of the testing requirements for certification to Part 1054 Standards.

EMA submitted two further comments on the regulatory language for the transition program for equipment manufacturers. First, EMA commented on §1054.625(g)(1)(iv) "What requirements apply under the Transition Program for Equipment Manufacturers?" EMA commented that equipment manufacturers will not be able to provide the name and address of the company that produces the engines that it will be using for the equipment exempted under this section prior to June 30, 2010. They commented that this requirement is impractical and should be deleted. Second, EMA commented on §1054.625(g)(2) "What requirements apply under the Transition Program for Equipment Manufacturers?" EMA commented that all manufacturers using the program should be required to comply with the reporting requirements set forth in this section for each year of the program, or until the manufacturer's ability to use the program has expired.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691

Our Response:

EPA is retaining the reporting and recordkeeping requirements for the TPEM program with some minor modifications, as noted below, in response to the comments summarized above. First, EPA is revising the provisions of §1054.625(j)(2)(i) to allow manufacturers to measure emissions prior to the catalyst to show that an engine would meet the Phase 2 standards. EPA believes it is appropriate to give manufacturers the option of measuring emissions either before the catalyst or with a non-catalyzed version of the exhaust system to show that an engine would meet the Phase 2 standards. Second, EPA is revising the provisions of §1054.625(g)i)(iv) to require equipment manufacturers to list the names of the manufacturer(s) whose engines they expect to use under the TPEM program. Because the information being requested is due before the TPEM program begins, EPA agrees that it would be difficult for an equipment manufacturer to know which manufacturer's engines it would be using for the following four years of the TPEM program. However, equipment manufacturers should have an idea of which manufacturers' engines it expects to use, and such information would be useful to EPA in monitoring the use of the TPEM program.

In response to the comment on §1054.625(g)(2), we are not making any changes to the regulations. EPA believes the referenced language already requires equipment manufacturers to report their use of the TPEM program to EPA for each year they participate in the program.

2.7.4 Labeling

What Commenters Said:

OPEI commented that to promptly respond to fluctuating demand, equipment manufacturers need the flexibility to designate their inventoried engines as either a Phase 3 TPEM engine or as a Phase 3 "Delegated Assembly" engine. The final TPEM labeling scheme must provide the needed flexibility to the OEM to designate his Phase 3 engines – after he has ordered and received his engine families In this regard, OPEI supported EPA's proposed labeling provisions for the equipment manufacturers, under which his label would simply state the equipment manufacturer's name and clarify that this is a TPEM engine. The engine manufacturer's original emission label will appropriately provide all the engine-emission information. A full content, equipment manufacturer, emission compliance label would be confusing to customers and agency personnel – regarding the certification, emission warranty, and other information typically provided by the engine manufacturer as specified in the engine labeling requirements. In the cases where the engine originates as a Phase 3 compliant product utilizing the Delegated Assembly provisions, the equipment manufacturer re-labeling of the engine must not interfere with the ability of the ultimate consumer or the agency to accurately identify the important information included on the engine label.

EMA commented that the content included on the engine/equipment manufacturer label should be sufficient to convey the fact that an engine is designated as a TPEM engine. EPA should not require the standard engine and/or equipment manufacturer emission compliance label to be placed on a TPEM engine. In the situation where a TPEM engine originates as a Phase 3 compliant engine under the delegated assembly program, the equipment manufacturer must be required to re-label the engine in a manner that will not interfere with the original engine label. EMA also commented on §1054.625(j)(2) "What requirements apply under the Transition Program for Equipment Manufacturers?" EMA commented that the reference in this section to the labeling requirement set forth in §1054.610(c)(7) is not appropriate and should be deleted.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691

Our Response:

EPA is retaining the labeling provisions for TPEM equipment as proposed with only minor changes as described below. As supported by OPEI, the regulations allow a manufacturer to designate engines purchased under the delegated assembly program as either a TPEM engine (with a separate TPEM label applied by the equipment manufacturer) or a fully compliant Phase 3 engine (with the appropriate aftertreatment installed by the equipment manufacturer). EPA notes that the TPEM label that must be placed on the equipment does require additional information than noted in OPEI's comment supporting the proposed labeling provisions. In addition to stating the name of the equipment manufacturer and noting that the engine is a TPEM

engine, the label must also contain contact information for the equipment manufacturer and the year in which the equipment is produced.

EPA disagrees with EMA's comment that a standard engine/equipment label should not be required on a TPEM engine. EPA believes it is important to require a full engine label on the engine as well as an additional equipment manufacturer label to identify TPEM equipment. The information on the labels allows EPA and others to identify important information about the engine and equipment that could be needed to verify compliance with the TPEM program. In response to EMA's comment on §1054.625(j)(2), EPA disagrees that the language is not appropriate. The citation is only a reference to the labeling requirements engine manufacturers must comply with for their delegated-assembly engines (which may end up as TPEM engines) and does not add any additional requirements. Therefore, EPA believes it is appropriate to include such a reference in the TPEM program regulations. It should be noted that in revising the regulations for the final rule, EPA has moved the labeling requirements for engines participating in the delegated assembly program to §1068.261, and therefore the language of §1054.625(j)(2) has been revised to reference the new section.

2.7.5 Additional provisions for imported products

What Commenters Said:

OPEI commented that it supports the proposed special provisions, including bonding, for foreign equipment manufacturers and importers of equipment made outside of the U.S. using TPEM engines.

Letters:

Commenter	Document #
OPEI	0675

Our Response:

EPA is adopting the provisions for foreign equipment manufacturers and importers of equipment made outside of the U.S using TPEM engines as proposed.

2.7.6 Relationship to tank permeation requirements

What Commenters Said:

OPEI commented that it supports the proposal to also allow equipment manufacturers to use non-compliant rotational-molded, "flex" fuel tanks on any of their equipment with TPEM engines. OPEI objects to EPA's proposed limit on "flex" fuel tanks requiring the OEM to first use up available banked credits or allowances from his early compliance with the fuel tank permeation requirements. This restriction takes away from the incentive for manufacturers to introduce compliant tanks early or to produce tanks with FELs below the standard. In addition,

they believe this restriction will overly-complicate the administration of the program with no benefits.

OPEI submitted an additional comment after the close of the comment period regarding rotational-molded fuel tanks. They supported a delay in the permeation requirements for rotational molded fuel tanks instead of the proposed linkage to the TPEM program.

Letters:

Commenter	Document #
OPEI	0675
OPEI	0793

Our Response:

EPA is revising the allowance for equipment manufacturers to use non-compliant rotational-molded fuel tanks on their equipment with TPEM engines for the final rule. EPA continues to believe that equipment manufacturers may face challenges in transitioning all of their rotational-molded fuel tanks to meet the new permeation standards in the timeframe for the new standards. However, based on discussions with manufacturers, we have been convinced that there is not necessarily a direct link between the potential TPEM engines/equipment and the use of rotational-molded tanks on those engines/equipment. We are therefore allowing equipment manufacturers to use noncompliant rotational-molded fuel tanks for two additional years on limited numbers of 2011 and 2012 model year equipment using Class II engines, regardless of whether the equipment is part of the TPEM program. Equipment manufacturers may use noncompliant rotational-molded fuel tanks if the production volume of the fuel tank design used in Class II equipment models is collectively no more than 5,000 units in the 2011 model year. In the 2012 model year, equipment manufacturers may use noncompliant rotational-molded fuel tanks if the production volume of the fuel tank design used in Class II equipment models is collectively no more than 5,000 units in the 2012 model year, but the total number of exempted rotational-molded fuel tanks across the manufacturer's Class II equipment is limited to 10,000 units. If production volumes are greater than 5,000 for a given fuel tank design, all of those tanks must comply with emission standards. Tank designs would be considered identical if they are produced under a single part number to conform to a single design or blueprint. In addition, tanks would be considered identical if they differ only with respect to production variability, post-production changes (such as different fittings or grommets), supplier, color, or other extraneous design variables.

2.8 Delegated assembly

2.8.1 Need for delegated assembly

What Commenters Said:

OPEI noted that EPA has proposed a permanent Delegated Assembly program (see §1054.610) specifically designed for small spark-ignition engines. The purpose of this program is to create a very protective compliance program that would allow non-integrated engine

manufacturers to distribute their certified engines without the required emission-related parts (i.e., catalyst) that are listed on and required for EPA certification. OPEI elaborated as follows:

> First, in the initial stage of developing the after-treatment system, the engine manufacturer must determine the catalyst-specific parameters including substrate size, precious metal loadings, and engine performance-related specifications to allow the catalyst to be packaged or canned so that it can be installed. The catalyst selection and packaging designs must provide the intended exhaust emission conversion and also manage exhaust and cooling air flow to ensure all safety concerns are addressed, and to manage sound and tonal qualities.
>
> Second, the engine manufacturer identifies the "standard" muffler packages that meet the criteria identified above. In many cases there is only one "standard" muffler configuration designed and developed by the engine manufacturer. Engine manufacturers cannot specify the diversity of mufflers required to fit into specific equipment or to install packaged catalysts into such customized mufflers. Such customization is a very time-consuming and resource-intensive exercise that adds significantly to the complexity of the engine manufacturer's product as supplied to the equipment manufacturer. It is highly unlikely that engine manufacturers would be able to fundamentally change their business structure to supply customized mufflers in the future. Such a change in their business models would be tantamount to asking a major international supplier of lumber, which sells large volumes of stock lumber to less than one hundred wholesalers, to only sell customized, small volume cabinets or furniture to thousands of individual customers.
>
> Third, for most Class II products, the catalyst prescribed by the engine manufacturer must be packaged into the muffler system prescribed by the equipment manufacturer because there is insufficient space to allow separate catalyst and muffler systems. Consequently, for the vast majority of Class II engines, engine and equipment manufacturers must depend on their independent muffler suppliers, who exclusively have the capacity and expertise to install catalysts properly into their customized mufflers. For most Class II products, the independent muffler supplier is the only party who can practically install catalysts into the mufflers for the vast majority of Class II engines and customize these products for the various equipment designs.
>
> Fourth, without Delegated Assembly, the engine manufacturer would have to include specific catalyzed mufflers in the box with his shipped engines. The OEM would not be able to use many of these purchased and shipped mufflers because they would not fit into his final, complete applications. This problem results from the fact that an equipment manufacturer cannot wait for specific orders from his downstream retailers before he orders his engines. The OEM must typically purchase and receive large volumes of the same engine family, which must be used in many different models. Each model will likely have different or unique muffler configurations. Unpredictable market demand will drive the OEMs ultimate production of specific equipment models and therefore the volumes of the different engine-muffler combinations the OEM will ultimately build. When the engine is shipped to the OEM, neither the engine manufacturer, nor the equipment manufacturer may know which exact equipment models and/or which muffler configurations wil be used with each specific engine family.

OPEI concluded their argument by noting that EPA must finalize a practical Delegated Assembly program which allows direct shipments of catalysts from a catalyst supplier to a muffler supplier, who will be accountable and responsible for proper catalyst canning and will install the required catalyst in each application, prior to shipping the specialized catalyzed muffler to the OEM.

OPEI commented that as part of this preamble discussion, EPA incorrectly suggests that many muffler geometries are fairly uniform and that it should be possible to produce more standardized, “stock” mufflers that could be supplied directly through the engine manufacturer (see 72 Fed. Reg. at 28152). OPEI believes EPA grossly over-simplified the problems and

challenges associated with applying and packaging exhaust/muffler systems onto a wide variety of equipment. While many mufflers have a somewhat common cylindrical geometry, the muffler mounting brackets, internal sound bafflers, and the header and tailpipe geometries vary greatly. One supplier of mufflers and exhaust components, released just under 100 unique components last year alone to address the variations in the muffler and exhaust configurations required to fulfill the OEM packaging requirements for these small engine applications. OPEI estimates that there are over 1000 different muffler configurations for these engines in the national marketplace today.

Traditionally, the muffler design is a compromise between exhaust back pressure, as prescribed by the engine manufacturer for emission compliance, and sound attenuation. The various applications these mufflers are installed in have unique trade-offs. OPEI commented that EPA needs to consider the unique requirements of the small engine market that serves applications such as: portable power, utility vehicles, golf carts, construction equipment, light towers, agricultural, etc. Other equipment may also have different requirements which can dramatically affect muffler designs. The application specific trade-offs often lead to unique internal design features of the muffler for each engine, in addition to external differences.

Of course, the principal challenge of muffler design is thermal management issues, which are safety-related and are a further constraint to application designs. The addition of a catalyst will create additional complexities and challenges, especially when dealing with off-nominal conditions such as engine misfire situations (See Sections III and IV above). The thermal management issues lead to a variety of different insulation and heat shield scenarios, which result in unique muffler configurations specific to the product design. Current experience with the development of catalyzed muffler systems that meet California Tier III regulations has confirmed that these product-designs and complex heat and emission-related challenges will demand customized mufflers that are supplied by a third party.

For all these reasons, OPEI commented that it does not believe that there will or can be a shift in the market place towards standardized “stock” muffler designs. OEMs will continue to depend on customized mufflers to facilitate their product designs as required to service their diverse markets. Consequently, OPEI commented that the Delegated Assembly Program is absolutely crucial to satisfy the market needs of the small SI applications to obtain catalyzed mufflers from their muffler suppliers.

OPEI noted that EPA has requested comment on whether the transition program for equipment manufacturers somehow meets the need for the proposed Delegated Assembly Program (see 72 FR 28152). Conversely, EPA requested comment on whether manufacturers will need the equipment-transition program (described above in Section III) if they can independently source their exhaust systems based on the Delegated Assembly Program (see 72 FR 28154). OPEI responded that the answer to both of these questions is no. OPEI believes both programs are necessary. In fact, the two programs serve separate, distinct purposes. Finally, OPEI commented that EPA has failed to evaluate or quantify (in its administrative record or in its SBREFA process) the substantial economic damages that would result without either the proposed equipment flexibility or the Delegated Assembly provisions (proposed in §1054.610). EPA’s other off-road emission regulations explicitly recognize the separate and

independent need for Delegated Assembly, equipment-transition flexibilities, and hardship relief. Consequently, OPEI commented that it would be arbitrary for EPA to abruptly eliminate any one of these flexibilities for small engines.

EMA supported the proposed delegated assembly and equipment manufacturer flexibility provisions included in the NPRM. EMA commented that EPA must incorporate both of these programs into the final rule. If EPA were to adopt the delegated assembly program only and not the equipment manufacturer flexibility program (or visa versa), the functionality of the adopted program would be significantly impaired by the absence of the other program.

Honda noted that in the market today for small engine products, multiple businesses cooperate to produce parts for numerous small engine powered machines that are the design, production, and marketing responsibility of a multitude of independent equipment manufacturers. Each manufacturer in the process, including the final equipment manufacturer, may design and manufacture, design and outsource the manufacture of, or simply purchase an existing part. This distinction is important to identify who should take responsibility for the actual performance of the part.

Today, for larger sales volumes, engine manufacturers cooperate closely with equipment manufacturers to meet the equipment manufacturers' product needs. At a smaller manufacturing volume there is less direct contact but the process of matching the engine to the equipment and the documentation of this process are still in place. The key to the appropriate use of a specific engine in a specific application is based on a basic engineering evaluation of the engine matching document and of the general instructions for engine use. This concept works well when the equipment manufacturer uses the engine as it was built by the engine manufacturer. However, in actuality, a wide variety of equipment is used on an even wider variety of tasks and the equipment manufacturer must be able to tailor the engine to fit both the equipment and the task. For example, a trencher, earth rammer, concrete equipment, and a lawn mower work in similar dust and debris environments, but the packaging of a single engine model in the least vulnerable location to make a workable machine can result in very different requirements. The proposal's preamble includes a comparison of a handful of mowing equipment and concludes that it would be possible to package a single engine design in all machines. Honda believes this fails to look beyond the most popular use of small SI engines and does not recognize the significant diversity of small engine powered types of equipment.

Honda commented that the need for an equipment manufacturer to have flexibility in the final assembly of engine intake and exhaust components is critical for both large and small volume equipment manufacturers. An engine manufacturer cannot economically stock or supply in a timely manner, the array of components required by the diversity of the market. Only the equipment manufacturer that functions as an independent business, striving to create or improve a machine's design and target a value price, is in a position to create the best product for its customers. Similarly, the engine manufacturer is in the best position to provide engine matching tools and instructions that ensure the final engine assembly will be in compliance with applicable regulations and will match the required certification information. In many cases the engine manufacturer and the equipment manufacturer will work jointly, or with a third party, to ensure that the design is compliant with the regulations.

Honda suggested two alternatives to the proposed means of ensuring that the final assembly of the equipment will comply with the regulations and answer the concern about enforcement of the regulation.

1) Honda noted that in some cases the engine and equipment manufacturer (and potentially a third party supplier or testing facility) work together to fulfill the equipment manufacturer's product design targets. During that process, they generate enough information and working instructions that the equipment manufacturer could then submit an abbreviated certification form and be identified to the EPA as the manufacturer with responsibility for the specific configuration of that engine model used in the equipment manufacturer's particular final product. EPA could then assume its rightful role and use the Selective Enforcement Audit mechanism or confirmatory testing to verify that the product meets the requirements of the regulation. EPA would also know in advance which manufacturer is taking responsibility for what part of the final assembly.

2) Honda suggested that EPA supplement the definitions in 1068.101(b) and the text in 1054.20 so that it is clear that failure to follow the engine manufacturer's instructions for delegated assembly is tampering and/or falls into the category of a defeat device. This option could be applied when the equipment manufacturer does not interact directly with the engine manufacturer and an abbreviated certificate is not submitted. The equipment manufacturer in this case would need to follow the engine matching and installation instructions using its own data or engineering evaluation. This type of situation could also be treated in a manner similar to 1060.101(f) in the evaporative emissions section where the equipment manufacturer is "deemed to be certified." EPA will then have the necessary enforcement authority when they perform a field or factory audit of equipment. A thorough examination of the steps involved in engine distribution, product design and manufacturing, and the role of third party suppliers should make it possible to retain EPA authority to ensure emission compliance without disrupting the ability of both engine and equipment manufacturers to deliver innovative and value priced product to the consumer.

CARB commented that EPA's overall approach to the proposed delegated final assembly is reasonable and corresponds to CARB's current certification procedures. CARB believes that EPA should require engine manufacturers to be held responsible for ensuring that the catalysts are installed on the engines that are accumulating credits. Since the engine manufacturer is receiving the benefit of accumulating credits for these particular engines, they should make sure that the catalysts are being installed. Any instance of an engine found without a complete emission control system, as certified, should be treated as noncompliant, with all possible penalties. Allowing any exceptions would send an inappropriate message to the manufacturers.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691
CARB	0682
Honda	0705

Our Response:

An important point to clarify before evaluating the commenters' arguments in support of delegated assembly is that under any conceivable regulatory scenario we would require mufflers that are shipped directly from the muffler manufacturer to the equipment manufacturer to be specifically included in the engine manufacturer's application for certification. While the commenters describe or imply a need for equipment manufacturers to have an unrestrained ability to work out design parameters with muffler manufacturers, we have neither proposed nor considered such an outcome. OPEI's description betrays an understanding that equipment manufacturers should have an unrestrained ability to change muffler designs parameters even if that affects emission levels. We acknowledge that muffler design involves compromises between back pressure, thermal management, and sound attenuation. A muffler design that is not specifically part of the engine manufacturer's application for certification will inevitably involve design parameters that favor non-emission factors over factors important for controlling emissions. The result would be a noncompliant engine and a situation where the certifying manufacturer will disclaim any responsibility for the performance of its own engine. This is clearly unacceptable. The certifying engine manufacturer is responsible for ensuring compliance and therefore needs to be in control of design variable that could affect whether engines meet emission standards or not.

We agree with the commenters that muffler manufacturers play an important role in incorporating an engine manufacturer's specified catalyst into a muffler that appropriately controls air flow for maintaining catalyst performance, managing external surface temperatures, and provides proper sound attenuation. However, this fact alone does not demonstrate that equipment manufacturers need to be able to get customized mufflers for every equipment model. There are many examples of current engine and equipment models in which mufflers and catalysts flow from component manufacturer to engine manufacturer to equipment manufacturer, with varying degrees of involvement by equipment manufacturers in the design parameters of the exhaust components. Regardless of the extent to which engine and equipment manufacturers would work out arrangements for delegated assembly, every engine manufacturer will need to certify their engines using some number of stock mufflers. In the transition to new emission standards, engine and equipment manufacturers will work out the degree to which multiple muffler configurations will be needed to meet the design needs for the range of equipment models that will be affected. The Transition Program for Equipment Manufacturers provides four years of a more flexible transition to allow for these negotiations and adjustments.

OPEI's analogy to a lumber supplier needing to start selling custom cabinets exaggerates the business dynamic in question. The comparison does not acknowledge that engine manufacturers are already selling the new product (engines with mufflers) in many cases, that

engine manufacturers are liable for the performance of the finished product, or that equipment manufacturers have to design their equipment around a given muffler design, whether or not the muffler is manufactured to their specifications. Our objective is not to create a better analogy, but the weakness of this comparison highlights our concern that the commenter is unable to provide a straightforward rational assessment of the situation.

The fundamental gap in the argument presented is the interplay between equipment and engine manufacturers in coming up with final design specifications. We believe that purchasing agents and design engineers working for the equipment manufacturers will have an important role in moving successfully into a new era in which engine manufacturers have a legal responsibility to ensure that exhaust systems are properly designed and assembled for compliance with exhaust emission standards. Purchasing agents for equipment manufacturers buying large volumes of engines can have a very significant influence over the engine manufacturer's design parameters. As a result, we would expect these dominant equipment manufacturers to effectively dictate muffler designs to ensure that available stock mufflers meet their needs, considering physical dimensions, thermal management, and sound attenuation. Engine manufacturers would want to make a reasonable number of muffler configurations available, so we would envision this process playing out such that several stock mufflers would be available.

Even under the broadest conceivable approach to delegated assembly, equipment manufacturers will be unable to get customized mufflers for their small-volume products. Since engine manufacturers need to agree to add each muffler configuration to their application for certification and enter into a contract with equipment manufacturers creating customized mufflers, there will be many cases where this option isn't viable or cost effective. Engine manufacturers may decide that a custom design presented to them by an equipment manufacturer is unacceptable, or they may be unable to provide the resources to make this determination. They may be unwilling to trust the equipment manufacturer to properly procure parts for and assemble the final products such that every engine is in its certified configuration before delivery to the end user. These potential complications were given credence by one manufacturer who communicated to us that their plan is to participate in delegated assembly using a custom muffler from an equipment manufacturer only if the equipment manufacturer performs a complete round of testing, including service accumulation over the engine's full useful life, to show that the new muffler design complies with the underlying certificate. This is more than we require currently, but it illustrates a prudent approach by engine manufacturers to protect themselves from the liability of delegating important compliance responsibilities to other companies.

Design engineers working for equipment manufacturers also have an important role to play in this process. While OPEI suggests that equipment manufacturers will need to discontinue production of equipment models if they can't procure customized mufflers, we believe this ignores the equipment manufacturers' ability to adjust the designs of their equipment to accommodate a specific muffler configuration supplied to them by an engine manufacturer. As noted in the comments, there are many examples of custom muffler designs that are tailored to a specific type of equipment. If that custom muffler was no longer available, design engineers for the equipment manufacturer could, for example, adjust mounting brackets, accommodate a different muffler orientation, or otherwise make the muffler fit to allow the equipment to

satisfactorily perform its function. While there would be a significant effort and expense to modify equipment designs just for a muffler change, the incremental effort of accommodating a muffler change as part of a broader equipment redesign is much smaller. Our understanding is that equipment models are typically redesigned every five to eight years. (The cost estimates in Chapter 6 of the Final Regulatory Impact Analysis take into account the cost of modifying equipment as part of an overall redesign.)

Customizing mufflers for sound attenuation and thermal management should be easily managed by the engine manufacturer. We believe engine manufacturers will be strongly motivated to meet market demands by working with muffler manufacturers to create a menu of stock mufflers that provide varying degrees of sound attenuation. The engine manufacturer would be well positioned to efficiently design for sound attenuation by integrating that effort into an overall design program to develop a catalyst and exhaust configuration that meets emission standards. Similarly, thermal management of exhaust surfaces is fundamentally related to engine operation. Engine manufacturers are best positioned to design mufflers (in cooperation with muffler manufacturers) such that all possible engine operating modes are considered when properly designing a muffler to avoid any risks associated with high surface temperatures.

We would also caution against the tendency to overstate the extent of change in muffler designs resulting from our proposal. Our testing to support the feasibility of the new emission standards showed that an existing muffler could be modified to incorporate a catalyst primarily by rearranging the internal flow paths, without significantly changing the muffler's outer dimensions. We also showed that this could be done without significantly increasing external surface temperatures. This is not to say that engine and muffler manufacturers won't develop mufflers that have notable differences from current designs, rather that we are not expecting dramatic changes in these designs. As a result, we believe the design challenge for equipment manufacturers will mostly involve the transition from customized to stock mufflers. As noted above, this will involve little or no change for high-volume products, because equipment manufacturers will in effect dictate that their custom design becomes one of the standard configurations from the engine manufacturer. For the remaining equipment models, we are confident that equipment manufacturers will be able to make the changes needed to accommodate a stock muffler, such as rearranging mounting brackets, repositioning mufflers, or otherwise to make the mufflers fit into the overall equipment design.

We also believe that the commenters grossly overstate the current need for customized mufflers. We stand by our observations in the preamble of our proposed rule regarding the standardization of mufflers in current products. The products we observed with relatively uniform muffler configurations represented a wide range of models, brands, and applications. Moreover, the general observation was that the nature of mufflers and exhaust systems is that they need space to safely and effectively route hot exhaust gases away from the engine and into the atmosphere. We suspect that the large number of muffler configurations produced today is mostly related to proper mounting, orientation, and plumbing to fit the muffler into the equipment. Redesigning most equipment for a standard muffler configuration should involve only modest changes to shift the position of the muffler or to change the cage or shielding or frame that currently houses the muffler. That is not to say that there aren't examples of mufflers that are more carefully tailored to specific equipment models, rather that we believe this practice

is much less common than suggested by the commenters. We understand that these changes will take time and effort, but we believe that they are well within reach for equipment manufacturers, especially as part of an overall equipment redesign. The time available before the standards take effect and the flexibility provisions built into the final rule should allow equipment manufacturers to work with engine manufacturers for an orderly transition in their equipment designs to the extent that is needed.

Two examples from observations made at the 2006 Louisville Expo for lawn and garden equipment highlight the difference in opinion as to the extent of the redesign that will be necessitated by this rulemaking. First, we observed a four-wheel drive utility vehicle in which the compartment to house the engine and the whole exhaust system were internal to the body of the vehicle, located primarily behind and under the driver's seat. This would seem to be a prime example of a need for a specialized muffler confined in a limited space, since every amount of space devoted to the engine and exhaust system was space made unavailable for passengers and payload. Despite this trade-off of utility and comfort, the vehicle design included a relatively large cavity for the muffler and other exhaust components. Clearly this amount of space was needed to provide adequate clearance from the exhaust surfaces to avoid exposing other parts of the vehicle to such high temperatures. We suspect that an effort to change to a different muffler, even one with a very different shape, would not be impossible.

In a second example, an equipment manufacturer complained vehemently that their engine supplier insisted on supplying the muffler with the engine, leaving them with the extraordinary burden of fitting the stock muffler into their equipment. The representative claimed to have a worst-case equipment model on display– a riding lawn mower with several premium features, including a plastic collection bin mounted behind the mower and over top of the exhaust system. In this case the muffler was mounted in a cage for preventing accidental contact with hot exhaust surfaces, again with rather generous spacing around the muffler. It was apparent that changing this equipment model would require significant time to address design concerns such as fit, weight distribution, exposure to radiant heat, etc. We believe, however, that these design challenges could all be addressed even by a company with very limited engineering resources. Having several years to plan and execute these changes seemed to be a very reasonable expectation, even in this worst-case configuration. These observations support our conclusion that equipment manufacturers will be able to respond to changing muffler designs in the context of the Phase 3 standards, especially if they have a transition period that will allow them to factor in the necessary changes in advance. Furthermore, the fact that there is already an example of an engine manufacturer telling its customers that only stock mufflers are available demonstrates that this can be a business decision negotiated between companies rather than one that is inherently and necessarily subject to the control of equipment manufacturers.

It is important to note the comparison with nonroad diesel engines, as we are expecting those engines to include new aftertreatment devices to meet Tier 4 standards. These aftertreatment devices will be new, relatively large components added to exhaust systems (not incorporated into existing mufflers) that equipment manufacturers will need to accommodate. We will allow the equipment manufacturers the flexibility of using limited numbers of previous-tier engines for several years (much like the Transition Program for Equipment Manufacturers described above). There is an expectation for the long term that equipment manufacturers will

be able to use stock aftertreatment devices from the engine manufacturers as part of their equipment design. The expected design effort for Small SI equipment pales in comparison to the efforts expected from the nonroad diesel equipment manufacturers. We also note that the program for nonroad diesel engines is the only other one in which we have adopted both delegated assembly and a Transition Program for Equipment Manufacturers. These are not universal and inherent aspects of our compliance programs, as suggested by OPEI.

Aside from the question of who designs catalyst and muffler configurations, we acknowledge that there are business reasons to prefer shipping mufflers directly from the muffler manufacturer to the equipment manufacturer. This was the original purpose of the delegated-assembly provisions we adopted in §1068.260. OPEI's comments appropriately describe the situation for an equipment manufacturer in that situation, needing to manage large numbers of equipment models, each with multiple engine and muffler configurations. The dynamics of managing inventories to produce all of these equipment models causes us great concern that every assembled unit is built properly in its certified configuration. This is the basis of the extensive protective measures we believe are necessary to ensure that engines are properly assembled.

We also acknowledge that, with proper constraints and controls, engine manufacturers can work with equipment manufacturers that they trust to install properly designed catalyzed mufflers. Some of these mufflers may have been designed by the equipment manufacturer together with the muffler manufacturer and coordinated with the engine manufacturer, such that final engine assemblies will meet the required standards. As a result, we believe it is appropriate for the final rule to include a carefully constructed delegated-assembly program for Small SI engines in addition to the Transition Program for Equipment Manufacturers that will allow manufacturers a flexible transition period to incorporate any engine or muffler design changes resulting from compliance with the Phase 3 standards. This transition period will allow time for market forces to work toward a sensible degree of accommodation between engine and equipment manufacturers as they find the best way of dividing design and assembly responsibilities such that they preserve the engine manufacturers' ultimate control over design and compliance responsibility and at the same time recognize the equipment manufacturers' need to make equipment that functions within the limitations in muffler design and specifications required due to certification. There is a continuing need for delegated assembly after this transition period, but we believe this is more of a business decision regarding the most efficient method of designing and shipping product than an inherent necessity for equipment manufacturers to be able to produce equipment with certified engines that can be used in a multitude of applications. Accordingly, we are adopting delegated-assembly provisions for Small SI engines that include greater initial flexibility, after which a narrower set of provisions apply, as described in Section 2.8.2.

We believe the proposed regulations already reflect Honda's suggested approaches for dividing responsibilities among engine and equipment manufacturers. The idea that equipment manufacturers rely on an abbreviated certification for designs that fall outside of the engine manufacturer's certified configurations was proposed in §1054.612. This gives the equipment manufacturer the ability to recertify an engine family without generating a new deterioration factor or conducting production-line tests. Also, the current regulations in §1068.105 clearly

state that equipment manufacturers violate the tampering prohibition if they fail to follow an engine manufacturer's installation instructions. However, it would not be appropriate for the engine manufacturer's installation instructions to simply specify broad design parameters that equipment manufacturers would then follow, with some unspecified testing or engineering evaluation to support a conclusion that the resulting engine design is covered by a certificate. The "deemed certified" approach proposed in §1060.101 is limited to requirements that are so straightforward that they can be established by simple observation. Evaluating compliance with exhaust emission standards is far from straightforward. We therefore believe that approach of considering engines certified through an informal demonstration does not meet the requirement under the Clean Air Act for engines to be certified based on a demonstration that measured emission levels are within prescribed limits. We also believe manufacturers would be unwise to delegate this level of responsibility to another company, since they would be held liable for any noncompliance resulting from any designs that fall short of meeting emission standards.

2.8.2 Specific provisions for delegated assembly

What Commenters Said:

General:

OPEI noted that EPA requested comment on the need for the specific provisions of the Delegated Assembly for small engines with catalyzed mufflers in comparison to other non-road engine/equipment categories as defined by current regulations (72 Fed. Reg. at 28149-28152). OPEI commented that the proposed small SI provisions are essential in order to respond to the following unique constraints of the small spark ignition engine and equipment industry: (1) the cost sensitive nature of the products produced; (2) the retail distribution system employed; and (3) the diversity of products. OPEI commented that the current generic Delegated Assembly Program fails to respond to each of these unique factors and would create totally impractical burdens (see §85.1713 and §1068.260). In turn, this would have a dramatic, adverse impact on both large and small outdoor power equipment manufacturers resulting in the elimination of many equipment models.

EMA commented that the Small SI engine and equipment industries have specific needs regarding delegated assembly that have been appropriately balanced with the regulatory requirements as specified in §1054.610 of the proposal along with the other changes recommended by EMA in this section. EMA commented that the final rule should not integrate these requirements with the general provisions prescribed in 40 CFR Part 1068, but should rather retain their independence in Part 1054.

Written confirmation:

OPEI commented that the regulations need to allow a small engine manufacturer to obtain written confirmation (within 30 days after shipping engines) that his OEM customer has ordered the appropriate catalysts as part of the initial shipment -approval process for delegated engines.

EMA commented on §1054.610(c)(9) "What is the exemption for delegated final assembly?" EMA commented that the proposed requirement is not viable. An engine manufacturer cannot "have written confirmation . . . for an initial shipment of engines..." and also ". . . receive the written confirmation within 30 days of shipment." Accordingly, EMA commented that the language should be revised to read as follows: "You must advise the equipment manufacturer that (i) written confirmation that the appropriate aftertreatment has been ordered is required within 30 calendar days of the initial engine shipment for a given model year; and (ii) if written confirmation is not received future engine shipments will not be allowed. The equipment manufacturer can meet the written confirmation requirement by notification to the engine manufacturer that engines will be used under the equipment manufacturer flexibility program defined in 40 CFR Part 1054.625."

Audits:

OPEI commented that engine manufacturers' audits of their respective OEM production practices (and confirmation that products meet the certified configuration) can be effectively accomplished in many different ways. The regulatory requirements should not constrain the options an engine manufacturer may utilize. OPEI commented that the final program should allow the small engine manufacturers to conduct audits of either the OEM's production process or his final assembled products (pursuant to EPA's proposal).

EMA commented that there are many different ways an engine manufacturer can effectively audit an OEM's production practices and confirm that products meet the certified configuration. The regulatory requirements should not place undue restraint on the engine manufacturer's ability to use the many viable options available. In order to accommodate the wide variety of engine manufacturer/OEM business relationships, the auditing requirements must be flexible. Each engine manufacturer has a variety of OEM customers ranging from the very sophisticated large business (where engine orders/deliveries are coordinated with equipment build schedules for just in time production) to small companies that may only place a single order each year. EMA commented that requiring certification documentation of all the various options an engine manufacturer may utilize is burdensome and ineffective. Certification documentation should be limited to an acknowledgement from the engine manufacturer of the need for the required audits and its intent to utilize the delegated assembly provisions.

EMA commented on §1054.610(c)(10) "What is the exemption for delegated final assembly?" The requirement to select individual equipment manufacturers equally among the volume quartiles is overly prescriptive with no added benefit to the environment. EMA commented that this section should be revised in order to provide for selection of equipment manufacturers from each quartile as much as possible. This will allow engine manufacturers to select equipment manufacturers for auditing based on their confidence in the equipment manufacturers processes.

Point of final assembly:

OPEI and EMA commented that the "point of final assembly" (when the exemption no long applies) will vary depending on the equipment manufacturer production process. Engines that are scheduled to be utilized in one equipment model may be pre-assembled with the expected exhaust system. Due to production-demand changes, these engines may be returned to

inventory with the intent of later assembly only to be reconfigured at a later date for installation into different equipment. This may result in the exhaust system being replaced. For purposes of determining whether an exemption has expired, OPEI commented that the "point of final assembly" should be defined as the point at which the final equipment is totally complete and ready to be introduced into commerce.

Labeling:

OPEI commented that if there are provisions required for the designation of Delegated Assembly engines on the emission compliance label, OPEI supports the use of an identifying mark on the permanent label, such as "DA" as an approved abbreviation for "Delegated Assembly."

CARB recommended a change to the proposed labeling requirements. EPA is proposing a partially completed label (temporary label) be placed by the engine manufacturer which would subsequently be replaced by a final permanent label by the equipment manufacturer upon completion of delegated assembly. Since the engine manufacturer is ultimately responsible for the final assembly and product as the holder of the Executive Order (in California) and Certificate of Conformity (federally), CARB recommended requiring the following:

Option 1: The engine manufacturer applies a partial permanent label, and following delegated assembly, the equipment manufacturer adds a supplemental permanent label (placed just below the original label) completing the labeling requirement. This procedure is similar to the approach used for rebuilt/replacement off-road compression-ignition engines.

Option 2: The engine manufacturer applies a complete permanent label and ships the incomplete engine to the equipment manufacturer who subsequently completes the delegated assembly. This option would have an added requirement that the engine manufacturer must demonstrate, as part of the certification process, that there are quality control procedures in place to ensure that the final assembly occurs correctly.

Production-line testing:

OPEI and EMA commented that engine manufacturers should be allowed flexibility regarding the equipment manufacturer supplied exhaust systems required for PLT testing, including the ability to inventory randomly selected samples for future PLT testing requirements.

EMA commented on §1054.610(c)(12) "What is the exemption for delegated final assembly?" EMA commented that this section should be revised in order to clarify that engine manufacturers may inventory equipment manufacturer supplied exhaust systems for production line testing, provided that such systems are randomly selected components that are representative of equipment manufacturer production.

Class I engines:

OPEI and EMA commented that Class I engines are generally sold complete with the engine manufacturer supplied exhaust system. However, there are a limited number of specialty products where this is not possible. Some Class I products have all of the same equipment manufacturer/customer demands that are necessary to provide a Delegated Assembly option for the larger Class II engines. OPEI and EMA commented that these Class I products should not be precluded from this required flexibility based only on their respective class.

Liability:

EMA commented that engine manufacturers utilizing the delegated assembly provisions and meeting all specified requirements (e.g., provide the equipment manufacturer with all information necessary to complete the engine assembly to it's certified configuration, and conduct the required audits) must be assured that the equipment manufacturer is responsible for delivering compliant product into commerce.

Honda noted that the NPRM takes the position that the engine manufacturer, as the engine certifying party, becomes responsible for the actions of the equipment manufacturer, an independent business. The NPRM essentially appoints the engine manufacturer to be the "Selective Enforcement Authority" and to perform audits of the equipment manufacturer as though the engine manufacturer were a government agency with authority to enter a business and inspect records. Honda does not believe EPA intends to relinquish its independent enforcement authority nor does Honda believe it is reasonable to ask the equipment manufacturer to submit, by contract or otherwise, to inspection by competing engine manufacturers, all of whom sell to his competitors, and in some instances produce the same type of product within their own company or a wholly owned subsidiary. Honda also noted that the NPRM states that the equipment manufacturer must follow the engine manufacturer's instruction or the equipment is not covered by the certificate of conformity and not legal to introduce into commerce.

Air filters:

EMA commented on §1054.610(e) "What is the exemption for delegated final assembly?" EMA commented that manufacturers must have the ability to certify engines without identifying a specific part number for the air filter. This ability must either be specifically incorporated into the regulatory language, or included in a clarifying regulatory support document. Current Certification Guidance and submission templates require inclusion of air filter part numbers as a condition of certification. However, this section would allow engine manufacturers to provide a definitive parameter, such as intake restriction range, to define the certified configuration. Therefore, equipment manufacturer installed intake systems meeting the engine manufacturer prescribed parameter would not be subject to these provisions.

References:

EMA commented on §1054.610(g)(2) "What is the exemption for delegated final assembly?" EMA commented that §1054.610(g)(2) includes an incorrect reference to paragraph (g)(2). This reference should be corrected to refer to paragraph (g)(1).

Within-company shipments:

EMA commented on §1054.610(m) "What is the exemption for delegated final assembly?" EMA noted that as set forth in §1054.610(d), engine manufacturers that install engines into equipment are not required to request an exemption or take any other extraordinary steps in order to do so. Likewise, engine manufacturers should be allowed to complete production of engines at different facilities without being required to request an exemption. Accordingly, EMA commented that this section should be deleted.

Evaporative systems:

EMA commented on §1054.610 "What is the exemption for delegated final assembly?" EMA commented that this section should be revised to add a provision similar to §1054.610(c) that would apply to the situation where an engine manufacturer certifies compliance to the evaporative standards and delegates final assembly of the evaporative system to the equipment manufacturer. Such a provision is of particular importance to small equipment manufacturers that cannot use fully integrated engines and do not have the resources to design and certify pursuant to the 40 CFR Part 1060 requirements.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
EMA	0691
Honda	0705

Our Response:

General:

As noted in the proposal and in the comments, we have already adopted delegated-assembly provisions for heavy-duty highway engines in part 85 and for nonroad engines in part 1068 in addition to what we proposed for Small SI engines in part 1054. We have made a comprehensive review of these various regulations to create a hybrid program that allows us to take what we believe is a robust approach that uniformly and broadly addresses the concerns related to the cooperative efforts of engine, equipment, and component manufacturers in designing and assembling certified systems. The combined approach, which incorporates elements of each of the three programs, is written in a new §1068.261. There is also an abbreviated version of §1068.260 remaining to describe a framework and general provisions related to the arrangements between engine and equipment manufacturers in taking engines through the assembly process to reach a certified configuration. Section 1.xx describes the approach we took to creating this unified program. The rest of this section describes how the final program differs from the proposal and responds to the specific concerns related to Small SI engines and equipment raised in the comments.

There are three principal differences between the proposed and final regulations for Small SI engines and equipment. First, we are allowing distributors to participate in delegated assembly, but distributors would need to act as equipment manufacturers, adding catalyzed mufflers where appropriate for shipment to equipment manufacturers. We proposed to allow distributors to act as agents on behalf of engine manufacturers to further delegate assembly to equipment manufacturers. We are allowing this only for the first four years of the Phase 3 standards (2011 through 2014 model years). While a more flexible approach is needed for the transition to new standards, as described above, we believe this is not appropriate for the long term because of concerns about the ability of engine manufacturers to ensure that engines will be assembled in the certified configuration. As described in the comments, assembling engines involves a very significant effort to differentiate different models and manage engines and components coming from multiple suppliers. We believe that there is too much risk of

miscommunication or misbehavior where a distributor is acting on behalf of the engine manufacturer to do design work, arrange for shipment, and manage audits and other oversight steps to ensure that potentially large numbers of very small equipment manufacturers properly assemble engines. Given the complexity and diversity of these arrangements, we expect that the question would be how extensive the noncompliance is, not whether there would be noncompliant engines. Such problems would be difficult to find and, if we do discover a problem, it would be difficult to hold any particular company accountable, given the distribution of responsibility among the several companies. Nevertheless, we expect to learn a lot from the experience of implementing these provisions. If we see that manufacturers can observe the regulatory requirements in a way that alleviates the concerns described here, we would be open to a regulatory amendment to continue the provisions related to distributors that we are adopting on an interim basis.

We understand that some companies will be too small to get an engine manufacturer to agree to participate in delegated assembly for some or all of their equipment models. In these cases, we believe distributors will in many cases be able to provide design support for the equipment manufacturer. Small equipment manufacturers could benefit from a distributors ability to participate in delegated assembly, but only to the extent that the distributor can coordinate muffler designs with the muffler manufacturer, the engine manufacturer, and the equipment manufacturer. Distributors often serve an important role in helping small equipment manufacturers with system integration to properly install engines and to maximize the performance of the equipment to match the engine's design parameters and specifications. Allowing distributors to participate in delegated assembly would be a natural fit with this role. We also recognize that some equipment manufacturers would have such small volumes or distinct equipment parameters t that they would not benefit from this limited role of distributors in delegated assembly. As a result, these companies would need to redesign their equipment as needed to be able to use one of the stock muffler configurations available from the engine manufacturer or distributor. As noted above, we believe this is achievable by the time the transition provisions expire in 2015.

Second, the final rule requires that audits minimally involve inspection of assembly procedures and production records, investigation of assembled engines, and confirmation that the number of aftertreatment devices shipped were sufficient for the number of engines produced. The proposal specified that an audit could include any one of these three things. As described above, we are concerned that insufficient oversight would lead to a situation where equipment manufacturers assemble engines such that they are not in their certified configuration, either as a simple mistake or to take advantage of the discretion allowed to get away with changes that reduce costs or change design parameters for some performance advantage. We believe the three activities noted are basic steps that should be part of any audit. Moreover, we specifically identify these as minimum steps for performing an effective audit. If we learn over time that these steps are insufficient, either for specific manufacturers or the industry as a whole, we may require additional auditing steps to ensure that engines are properly assembled.

A current enforcement case highlights the need for active oversight with delegated assembly. An engine manufacturer has been relying on installation instructions to ensure that equipment manufacturers install the proper air filter, which is identified specifically by part

number in the application for certification. It turns out that an equipment manufacturer was found to be substituting a different air filter for some perceived advantage, either for cost or performance, which caused the engines to be sold in an uncertified configuration. The engine manufacturer had taken steps to make the information available to equipment manufacturers, but this was clearly not enough to ensure that final assemblies involved only engines in a certified configuration. In anticipation of engines using catalyzed mufflers, we see the incentive for departing from an engine manufacturer's installation instructions only increasing. We therefore believe that delegated assembly can be successfully done only with an active program to oversee and document compliance with installation instructions.

Third, we specify a different schedule for the number of audits that engine manufacturers must perform after the first four years. In fact, the change involves a smaller number of audits, based on our expectation that a smaller number of equipment manufacturers will be participating in delegated assembly after the transition to the Phase 3 standards is complete.

The following paragraphs respond to the individual concerns expressed in the comments.

Written confirmation: OPEI's suggestion is consistent with our proposal. The final rule preserves this provision, not only for small businesses but for all companies.

We believe this requirement is quite clear and viable, reflecting the need for confirmation with the business realities of ordering and shipping engines. In particular, we believe it is not sufficient for equipment manufacturers to satisfy the requirement for written confirmation simply by notifying the engine manufacturer that they are aware of the regulatory requirements. This requirement is in the context of a scenario in which the equipment manufacturer is separately procuring and paying for aftertreatment devices. There is a substantial risk for engine manufacturers to send out noncompliant products without this assurance, so we believe engine manufacturers would want to treat the regulatory requirement as a minimum for ensuring that their engines do not reach ultimate purchasers in an noncompliant configuration.

Audits: In a situation where delegated assembly does not require engine manufacturers to include the price of aftertreatment with the price of the engine, we are concerned that there is too great an incentive for equipment manufacturers to deviate from the specified installation instructions, either to reduce costs or to gain some perceived performance advantage. As described above, we believe an effective audit that minimally includes the three elements specified under the current regulations in §1068.260 is essential for maintaining proper oversight of the assembly process. The application for certification should include enough information to make clear that the certifying engine manufacturer will properly fulfill its auditing responsibilities.

We believe it is appropriate for engine manufacturers to follow an auditing plan that involves reasonably objective directions for selecting equipment manufacturers. Adding "as much as possible" to this direction would make it meaningless. As noted by EMA, certain equipment manufacturers will have earned more or less confidence based on their relationship with the engine manufacturer and their past performance. Allowing engine manufacturers more discretion in this regard would only allow them to delay auditing equipment manufacturers for

which there is less confidence that everything is in order. If engine manufacturers are particularly concerned about any one equipment manufacturer, they should be sure to audit that company independent of the specific regulatory requirements, or simply terminate the arrangement for that company.

Point of final assembly: We specified in the proposal that the exemption expires at the point of final assembly because there is a need to avoid a situation in which a delegated-assembly engine is introduced into commerce in an uncertified configuration where we would not want to consider that a violation. The exemption therefore covers a shipment from the engine manufacturer to the equipment manufacturer (or from one of the equipment manufacturer's facilities to another). There is no need for an exemption for other internal processes after the equipment reaches the point of final assembly, because its engine needs to be in a certified configuration the next time it is introduced into commerce. There is no violation for an engine that is placed into inventory at the end of the assembly line and then pulled back for trading out exhaust components to be in a different certified configuration. Note however, that if an EPA inspection of an equipment manufacturer's inventory of completed products turns up engines that are not in a certified configuration, we would take steps to address the nonconformity, as allowed under the regulations.

Label: We agree that abbreviating "Delegated Assembly" may be appropriate, so we are revising the regulation to allow labels with "DEL ASSY" where space prevents the full designation. Especially with the approach we are taking for labeling with respect to evaporative emission families, further abbreviating the term would only be confusing or inappropriate.

The proposed rule included labeling requirements consistent with CARB's second recommended option. We are adopting similar labeling requirements for the final rule, including the option of either applying a temporary label or identifying "delegated assembly" on the permanent label. This ensures that the engine will be properly identified at every point in the assembly (and shipping) process. We believe equipment manufacturers should not be responsible for labeling engines where they are simply assembling the exhaust system.

Production-line testing: We agree that manufacturers should be able to maintain an inventory of randomly selected components for testing. We have revised the regulations accordingly.

Class I engines: We agree that engine manufacturers may need to use the delegated-assembly provisions for Class I engines, though this should be far less common than for Class II engines. We are therefore preserving this provision in the final rule.

Liability: The regulations appropriately state that engine manufacturers are liable for the in-use compliance of every certified engine. The delegated-assembly provisions are an option that engine manufacturers may exercise based on their business interests and their relationships with equipment manufacturers. Choosing to use these provisions does not change the fundamental responsibility associated with certifying engines, to ensure that engines comply with the regulations throughout the useful life. In addition, the regulations also make clear that

equipment manufacturers are in violation if they introduce equipment into commerce without following the engine manufacturer's installation instructions.

If an equipment manufacturer has been found to be in violation, we specify that we may require the engine manufacturer to discontinue the use of delegated assembly for that manufacturer (revoking the exemption). We would generally not hold engine manufacturers responsible for noncompliant engines where the equipment manufacturer is fully responsible for the noncompliance. However, we would hold engine manufacturers in violation if they intentionally submitted false or incomplete information (voiding the exemption).

Honda correctly notes that we are not surrendering our enforcement authority with respect to delegated assembly. However, we have described our basis for being concerned that engine manufacturers do more than simply send incomplete engines with installation instructions, trusting equipment manufacturers to properly complete engine assembly subject to EPA's enforcement of applicable requirements. Delegated assembly is fully optional, so any engine or equipment manufacturers not wanting to be subject to the required oversight functions, or not wanting to be in a situation where confidential business information would be compromised, may choose not to participate in delegated assembly. Engine manufacturers could also take the middle ground, participating in delegated assembly but including the price of aftertreatment in the price of the engine. In this case, the regulations specify a significantly lighter oversight burden. Since the engine manufacturer is choosing to participate in delegated assembly, it is unclear why there would be any thought that they should take steps to ensure that engines are assembled properly. Third-party auditors could do on-site visits if there is a sensitivity regarding access to a competitor's facilities or records. Moreover, we specifically state in the regulation that information submitted between companies under these regulatory provisions is considered to have been equivalent to a submission to EPA. The prohibitions in §1068.101 and the corresponding civil and criminal penalties apply for any false information that a company submits to another company.

Air filters: The regulations include the clarifying language requested by EMA in which we specify that air filters are subject to the delegated-assembly requirements only if the manufacturer's certification depends on identifying the air filter by part number. In contrast, if the manufacturer certifies an engine based on specified intake restrictions, the delegated-assembly provisions do not apply. In this scenario, the engine manufacturer would still be responsible for the in-use compliance of any engines in the engine family that were assembled following the applicable installation instructions.

References: We have revised the regulations such that this reference is obsolete.

Within-company shipments: The final regulations include the streamlined provisions for engine manufacturers that also manufacture equipment and install their own engines.

Deleting the provisions related to completing production at different facilities would disallow this practice entirely. We need to be aware of this practice and to be able to set conditions or require specific steps to ensure that the exemption is not abused. We therefore need to base this exemption on EPA approval; however, we specify that the manufacturer must

simply describe this practice in the application for certification. Approving the certification is considered approval of the exemption. We are therefore retaining this provision as proposed.

Evaporative systems: Engine manufacturers must comply with evaporative emission standards to the extent they assemble fuel-system components. They are not responsible for further assembly of the fuel system by equipment manufacturers so there is no need for an exemption or other provisions analogous to delegated assembly.

2.9 Equipment manufacturer recertification

What Commenters Said:

OPEI supported EPA's proposal to allow the re-certifying equipment manufacturers to: 1) only conduct low-hour emission testing on the "green" modified exhaust system; and 2) rely on and apply the engine manufacturer's previously established deterioration factors. OPEI commented that EPA has also appropriately proposed not to apply PLT testing to the re-certifying OEM as this would overly-complicate this process without any benefits since the engine would already be subject to PLT. OPEI commented that this re-certification provision should be permanent and not expire. OEMs will still require muffler certifications on a long-term basis to produce certain critical equipment models.

Regarding equipment manufacturer recertification, CARB believes that such a provision would conflict with anti-tampering regulations. CARB commented that an alternative would be the equipment manufacturer working with the engine manufacturer (holder of the executive order) to include his/her variation as a running change and re-testing for a new worst-case model/configuration. However, if EPA does adopt the provision to allow equipment manufacturer recertification, CARB commented that EPA should require production line testing and impose an expiration date for the program.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682

Our Response:

We agree that there may be a continuing need for equipment manufacturers to rely on the streamlined certification proposed in §1054.612 where they rely on a catalyst from an already-certified engine family. The streamlined certification would allow the equipment manufacturer to assemble that catalyst in a custom muffler configuration. We believe this situation calls for a reduced certification burden, especially for developing deterioration factors.

We also believe that there will be a reduced need for this as time passes. As described above, the four-year transition program should allow time for engine and equipment manufacturers to work out arrangements for designing and producing mufflers in compliant

configurations. As a result, we believe it is appropriate to limit the provisions for streamlined certification starting in 2015. In discussion with manufacturers, there was general agreement that an appropriate threshold would be annual sales of 5,000 units, which is already established as the threshold for defining small-volume engine families.

There is no violation of the tampering prohibition because the engine would never be introduced into U.S. commerce in an uncertified configuration.

We agree that changes coming in response to an equipment manufacturer's needs could be factored in as a running change for the certifying engine manufacturer (with new testing as needed). This would require no new regulatory provisions; however, the proposed approach addresses the situation where the engine manufacturer does not want to be responsible for the changes called for by the equipment manufacturer.

We will monitor the use of this provision over time, both for its frequency of use and the degree of compliance. We may choose to discontinue the streamlined recertification provisions in the future, but we believe there is enough chance that equipment manufacturers will depend on it that it can be appropriately applied beyond 2014 for small-volume emission families as described above.

2.10 Compliance provisions

2.10.1 Warranty assurance

What Commenters Said:

OPEI and EMA noted that the proposal implements a change in the requirements for manufacturers to provide emission warranty service including provisions that deal with people living more than 100 miles from an authorized service center starting in 2009 model year. OPEI and EMA understand the agency's concern that customers must have access to sources of emission warranty but they do not support the prescriptive solution associated with authorized service centers within 100 miles of every customer. It will be virtually impossible for engine or equipment manufacturers to identify where the ultimate purchaser of a piece of equipment may use the equipment and therefore impossible to properly identify for the agency that the requirement has been met. The relief purported to be provided regarding sparsely populated areas is also not viable. If any provision is required beyond the need for at least one distributor within the United States, OPEI and EMA recommended that the servicing dealer requirement be linked to population centers with a 2000 U.S. Census population in excess of 100,000 people. (See §90.1103 Emission warranty, warranty period and §1054.120(f)(3) and (4) What emission-related warranty requirements apply to me?)

CARB supported EPA's "Special Provisions for Compliance Assurance," and specifically supported the provisions regarding the assurance of warranty coverage.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
EMA	0691

Our Response:

Certifying manufacturers must not only sell a product that meets emission standards, but also meet obligations over a defined period of service. The most obvious requirements related to in-use engines are warranty and recall. We are aware that many low-cost engines are sold by foreign manufacturers with little or no presence in the U.S. market for honoring warranty claims. This is a violation of the regulations, subject to substantial penalties. We believe it is very important to take the preventive step at certification to have companies describe their plan for meeting warranty obligations than to wait until there is a violation. The proposed approach was an attempt to reasonably balance a consumer's need to be able to access an authorized service center with the manufacturer's burden to maximize coverage with their repair facilities.

We believe it is clearly necessary to require more than a single parts distributor in the United States to expect a manufacturer to be able to provide effective warranty coverage for consumers. We agree with the approach recommended by the manufacturers to say that they can demonstrate adequate warranty coverage by placing authorized service centers in all U.S. population centers with a census count of 100,000 or more. Table 2-1 identifies 251 areas from the 2000 census that qualify, listed alphabetically by state. We have modified the regulations to allow for this demonstration.

We are also aware that some companies may not sell engines throughout the United States, in which case they would not be expected to maintain authorized service centers in all the identified population centers. We are keeping a modified version of the proposed requirement as an alternative to the commenters' suggestion to rely on the list of population centers. This would allow manufacturers to choose from a variety of methods for demonstrating an ability to respond to warranty claims.

We are adopting two main changes to the proposed approach related to warranty demonstrations. First, we are clarifying that the distance from consumers is based only on the contiguous United States. This allows us to avoid an expectation that manufacturers maintain multiple service centers across Alaska or in every U.S. territory. Second, we are revising the provisions related to sparsely populated areas. While the proposal allowed for up to 10 percent of sales to be to owners living more than 100 miles from an authorized service center, we agree that this would be difficult for manufacturers to implement. We are instead specifying that the 100-mile limit does not apply in states with any high-altitude areas (see 40 CFR part 1068, Appendix III). Identifying states with high-altitude areas aligns quite closely with low population density.

To the extent that the 100-mile approach or the population centers doesn't fit well nationwide for a given manufacturer, we would also allow for a combined approach in which the

manufacturer would rely on one method for certain states and another method for other states. However, we would require each state to have at least one authorized service center unless the manufacturer is able to meet the 100-mile specification without having an authorized service center in a given state.

Also, we proposed to apply these requirements in the 2009 model year, but we believe the timing of the final rule dictates that we allow an additional year for manufacturers to meet these new requirements. We have therefore modified the regulations to require manufacturers to comply starting with the 2010 model year.

Table 2-1

U.S. Population Centers over 100,000 – U.S. Census, 2000*

Birmingham, AL
Huntsville, AL
Mobile, AL
Montgomery, AL
Anchorage, AK
Chandler, AZ
Gilbert, AZ
Glendale, AZ
Mesa, AZ
Peoria, AZ
Phoenix, AZ
Scottsdale, AZ
Tempe, AZ
Tucson, AZ
Little Rock, AR
Anaheim, CA
Antioch, CA
Bakersfield, CA
Berkeley, CA
Burbank, CA
Chula Vista, CA
Concord, CA
Corona, CA
Costa Mesa, CA
Daly City, CA
Downey, CA
El Monte, CA
Elk Grove, CA
Escondido, CA
Fairfield, CA
Fontana, CA
Fremont, CA
Fresno, CA
Fullerton, CA
Garden Grove, CA
Glendale, CA
Hayward, CA
Huntington Beach, CA
Inglewood, CA
Irvine, CA
Lancaster, CA
Long Beach, CA
Los Angeles, CA
Modesto, CA
Moreno Valley, CA
Norwalk, CA
Oakland, CA
Oceanside, CA
Ontario, CA
Orange, CA
Oxnard, CA
Palmdale, CA
Pasadena, CA
Pomona, CA
Rancho Cucamonga, CA
Richmond, CA
Riverside, CA
Roseville, CA
Sacramento, CA
Salinas, CA
San Bernardino, CA
San Buenaventura (Ventura), CA
San Diego, CA
San Francisco, CA
San Jose, CA
Santa Ana, CA
Santa Clara, CA
Santa Clarita, CA
Santa Rosa, CA
Simi Valley, CA
Stockton, CA
Sunnyvale, CA
Thousand Oaks, CA
Torrance, CA
Vallejo, CA
Visalia, CA
West Covina, CA
Arvada, CO
Aurora, CO
Colorado Springs, CO
Denver, CO
Fort Collins, CO
Lakewood, CO
Pueblo, CO
Thornton, CO
Westminster, CO
Bridgeport, CT
Hartford, CT
New Haven, CT
Stamford, CT
Waterbury, CT
Washington, DC
Cape Coral, FL
Clearwater, FL
Coral Springs, FL
Fort Lauderdale, FL
Gainesville, FL
Hialeah, FL
Hollywood, FL
Jacksonville, FL
Miami, FL
Miami Gardens, FL
Miramar, FL
Orlando, FL
Pembroke Pines, FL
Port St. Lucie, FL
St. Petersburg, FL
Tallahassee, FL
Tampa, FL
Athens-Clarke County, GA
Atlanta, GA
Augusta-Richmond County, GA
Columbus, GA
Savannah, GA
Honolulu, HI
Boise City, ID
Aurora, IL
Chicago, IL
Joliet, IL
Naperville, IL
Peoria, IL
Rockford, IL
Springfield, IL
Evansville, IN
Fort Wayne, IN
Indianapolis, IN
South Bend, IN
Cedar Rapids, IA
Des Moines, IA
Kansas City, KS
Olathe, KS
Overland Park, KS
Topeka, KS
Wichita, KS
Lexington-Fayette, KY
Louisville-Jefferson County, KY
Baton Rouge, LA
Lafayette, LA
New Orleans, LA
Shreveport, LA
Baltimore, MD
Boston, MA
Cambridge, MA
Lowell, MA
Springfield, MA
Worcester, MA
Ann Arbor, MI
Detroit, MI
Flint, MI
Grand Rapids, MI
Lansing, MI
Sterling Heights, MI
Warren, MI
Minneapolis, MN
St. Paul, MN
Jackson, MS
Independence, MO
Kansas City, MO
Springfield, MO
St. Louis, MO
Lincoln, NE
Omaha, NE
Henderson, NV
Las Vegas, NV
North Las Vegas, NV
Reno, NV
Manchester, NH
Elizabeth, NJ
Jersey City, NJ
Newark, NJ
Paterson, NJ
Albuquerque, NM
Buffalo, NY
New York, NY
Rochester, NY
Syracuse, NY
Yonkers, NY
Cary, NC
Charlotte, NC
Durham, NC
Fayetteville, NC
Greensboro, NC
Raleigh, NC
Winston-Salem, NC
Akron, OH
Cincinnati, OH
Cleveland, OH
Columbus, OH
Dayton, OH
Toledo, OH
Norman, OK
Oklahoma City, OK
Tulsa, OK
Eugene, OR
Portland, OR
Salem, OR
Allentown, PA
Erie, PA
Philadelphia, PA
Pittsburgh, PA
Providence, RI
Charleston, SC
Columbia, SC
Sioux Falls, SD
Chattanooga, TN
Clarksville, TN
Knoxville, TN
Memphis, TN
Nashville-Davidson, TN
Abilene, TX
Amarillo, TX
Arlington, TX
Austin, TX
Beaumont, TX
Brownsville, TX
Carrollton, TX
Corpus Christi, TX
Dallas, TX
El Paso, TX
Fort Worth, TX
Garland, TX
Grand Prairie, TX
Houston, TX
Irving, TX
Laredo, TX
Lubbock, TX
McAllen, TX
Mesquite, TX
Pasadena, TX
Plano, TX
San Antonio, TX
Waco, TX
Wichita Falls, TX
Salt Lake City, UT
West Valley City, UT
Alexandria, VA
Arlington CDP
Chesapeake, VA
Hampton, VA
Newport News, VA
Norfolk, VA
Richmond, VA
Virginia Beach, VA
Bellevue, WA
Seattle, WA
Spokane, WA
Tacoma, WA
Vancouver, WA
Green Bay, WI
Madison, WI
Milwaukee, WI

*Source: U.S. Census Bureau (see http://www.demographia.com/db-usmuni2004.htm)

2.10.2 Bonding

What Commenters Said:

OPEI noted that its members are facing an enormous threat from manufacturers of non-compliant engines – particularly as the costs increase to produce even cleaner, EPA-compliant products. The current EPA framework is not designed with the safeguards needed to address the imminent threat from "bad actors" with no U.S. assets. Certain off-shore manufacturers have become very sophisticated in relying on "shell importers" in order to avoid any meaningful enforcement exposure.

OPEI commented that the final Phase 3 small engine regulations should require a foreign manufacturer (that has no U.S. assets) to post a bond to cover a portion of his engines in case they do not comply with the EPA emission standards. These bonding requirements are really the only meaningful mechanism EPA has to take action against a "bad foreign actor" who sells non-compliant engines through a "shell importer" and disappears if his non-compliant products are discovered. OPEI therefore supported EPA's proposed bonding requirements for foreign manufacturers and importers with no U.S. assets to create an even and effective compliance and enforcement program. OPEI urged EPA to pull ahead and make effective in 2007 the bonding requirements.

OPEI commented that it does not believe it would be necessary or appropriate to impose such bonds on established manufacturers that have adequate U.S. assets to cover non-compliance events. Even with EPA's new proposed, bonding requirements, manufacturers with substantial U.S. assets will still have dramatically greater compliance exposure (and incur greater costs) than a foreign manufacturer which just submits a bond.

OPEI commented that there should not be any other exemptions from the bonding requirements given the difficulty in defining an objective and practical criterion for preventing enforcement abuses. OPEI is skeptical that EPA can develop clear and objective regulatory language that would establish an exemption to the bonds for manufacturers that have a demonstrated long-term record of no violations. Moreover, OPEI is concerned that many manufacturers have previously certified engines, but not shipped any products into the U.S. market. Thus, the fact there has not been a known prior violation does not really indicate that such a manufacturer is a "responsible" company. OPEI also does not believe EPA will be able to establish clear and objective standards to exempt from the bonding requirements either manufacturers or importers who had been certified to voluntary industry standards for production quality (such standards do not currently exist) or who performed voluntary in-use testing. Deliberate "bad actors" intent on circumventing the regulations will be willing to also fabricate their compliance with production quality standards or voluntary in-use testing.

Euromot commented that, as importers, they accept the bonding requirements (or equivalent U.S. assets) and concept of a stronger market surveillance option within the proposed regulation.

CARB commented that it supports U.S. EPA's "Special Provisions for Compliance Assurance," and specifically supports the provisions regarding importation data, the assurance of warranty coverage, and bond requirements. The posting of bonds to cover compliance or enforcement-related obligations for importers who have not yet proven financial stability is crucial. Without the bonds, consumers may not be able to obtain needed warranty coverage. Also, if the imported engines are found not to meet the standards then enforcement actions can be made using the bond funds. Once a company gets into good financial standing, determined by EPA, then the company can be refunded the bond funds. Overall, CARB agreed with EPA that a bond requirement is necessary. However, CARB asked that in the proposed regulatory language EPA not preclude California from adopting a similar program should CARB deem it appropriate in the future for California certified engines.

Briggs & Stratton commented that it supports the bonding requirements in the NPRM. It is imperative for the small engine industry that all manufacturers are accountable for meeting the emission regulations, not just those located in the U.S. who are therefore susceptible to EPA enforcement actions. Companies with U.S. assets sufficient to cover enforcement actions should not be required to post import bonds, but companies without such U.S. assets should post bonds to ensure uniform enforcement for all manufacturers.

EMA supported the bonding requirements set forth in the NPRM. Such requirements are an important step to creating a level playing field among all competitors. Engine manufacturers that do not have sufficient assets in the United States to avoid the bonding requirement also are unlikely to have adequate resources in the U.S. to audit equipment manufacturer use of the delegated assembly provisions. Manufacturers that have significant physical assets in the United States can easily be identified, and EPA can take appropriate legal action as required when/if there is a compliance concern. EPA does not have access to manufacturers without assets in the United States, making it difficult, if not impossible, to take enforcement action against such entities. EMA commented that the proposed bonding provision correctly requires all parties responsible for compliance with the Phase 3 regulations to have assets in the U.S. (whether physical assets, or a posted bond) that may be attached in connection with an enforcement action. If the proposed bonding provisions are not adopted, EMA commented that it is imperative that EPA adopt another means to ensure that it has the ability to take enforcement action against manufacturers that do not have assets located in the United States. In addition, the enforcement provisions associated with Part 1054 and Part 1060 apply to any party that introduces product into commerce in the United States and EPA should exercise its authority accordingly.

EMA commented on §1054.690 "What are the bond requirements for importing certified engines and equipment?" EMA commented that the last part of the last sentence in paragraph (a) does not make sense as drafted. Accordingly, EMA suggested that the sentence should be revised to read as follows (new language is in italics): "For example, it would be a sufficient demonstration if you show that you have manufactured or imported engines for the U.S. market for a significant period of time *without failing a test conducted by EPA officials or being found to be substantially not in compliance with EPA regulations*."

The National Association of State Fire Marshals commented that their preliminary review suggests that the Chinese are capable of making a significant impact on the United States market.

They noted that they have seen this before, with Chinese manufactured All-Terrain Vehicles (ATVs) capturing over 30% of the U.S. market in just a few years. ATV's which they have tested, and provided to CPSC, failed to meet the applicable American National Standard and they recommended that they be recalled.

The National Association of State Fire Marshals commented that EPA's proposed Phase 3 Certification and compliance provisions are well suited for the legacy engine and equipment manufacturers that have an established track record for meeting EPA's Phase 2 requirements. They noted that EPA recognized the concerns with imported products, and their plans are noteworthy. However, new entrants from China can be expected to defy these provisions. Their experience enforcing CPSC regulations has shown that Chinese manufacturers and importers are willing to falsify conformance with CPSC regulations and to "port shop" until entry into the United States is achieved.

Letters:

Commenter	Document #
OPEI	0675
CARB	0682
Euromot	0649
Briggs and Stratton	0657
EMA	0691
National Association of State Fire Marshals	0673

Our Response:

We agree with the comments noting the need for bonding provisions to ensure that companies without substantial U.S. assets should be subject to bonding requirements to ensure enforcement with their obligations associated with certifying engines. Bond payments would allow EPA to compel companies to take actions or pay penalties where there might otherwise be no way of enforcing regulatory requirements. The bond payment would not apply for companies with substantial physical assets in the United States, since they are inherently subject to EPA's enforcement of regulatory requirements because we have access to the company's personnel and facilities to compel compliance or payment of penalties.

We also note that bonds are generally not paid in a lump sum and then refunded after some period. Rather, companies pay a premium to a bond agent who then opens a policy or account with a face value equal to the amount of the bond obligation, much like an insurance policy. Any EPA judgments against the company would generally be paid by the bond agent out of the account. As a result, the expense for maintaining a bond is simply the regular premium for maintaining a valid bond.

We are not including in the regulation any provision that would preclude California from adopting its own requirements for bond payments. However, any bond requirements in California would need to conform with any prevailing legal authority related to international trade.

We believe that basing bond payments on adherence to industry standards such as ISO 14000 would not be effective in assigning bond responsibilities where that would be necessary or appropriate, as described in the comments. We also believe it would not be appropriate to simply waive bond requirements based on some measure of compliance history, though we are prepared to set a lower threshold as an asset test as described below.

In discussions following the end of the comment period, manufacturers made three recommendations regarding the implementation of a bond requirement. First, they pointed out that there should be a minimum bond value rather than relying only on the published per-engine bond values. This would prevent small-volume importers from being responsible for maintaining a bond whose value is too small to provide any reasonable assurance of compliance or any practical ability to cover possible financial judgments if the company or its products are found to be in violation. We believe it would be necessary to require a bond value of $250,000 if the calculated value based on a per-engine calculation is less than that. This would ensure that the bond would cover a violation involving eight engines (or eight days where penalties are calculated per day). We believe any smaller bond value would be insufficient to achieve the objectives described above.

Second, manufacturers suggested $10 million of physical assets as a threshold value for determining whether a company has enough of a presence in the United States to avoid a bond payment. This would include any property to which the company possesses a clear title. The value of any given property should be based on a commercial appraisal. A mortgage or other debt obligation associated with the property would not affect the value with respect to determining whether bond requirements apply. We believe a $10 million threshold is high enough to avoid a situation where foreign manufacturers can make a token property investment to avoid bond payments, without imposing bond obligations on companies that have sufficient assets for demonstrating an ability to meet compliance and enforcement obligations. However, we believe smaller amounts would be appropriate for secondary engine manufacturers, where the capital investment for a given level of engine production may be much smaller as a result of the business practice of buying engines that are already nearly complete. We therefore believe $6 million is an appropriate threshold for secondary engine manufacturers. Also, we are aware that there is a reduced need for bond payments where companies have a consistent record of meeting their certification and compliance obligations. As such, we believe a reduced threshold of $3 million in U.S.-based assets is appropriate for companies that have certified for the previous ten years without being found in noncompliance.

Third, manufacturers pointed out that the bond payment should not be a condition of certification. We agree that manufacturers should not be required to post a bond before they certify their engines. However, we believe it is necessary for companies to describe in the application for certification why they should be exempt from the bonding requirements, if applicable. This would allow us to take any appropriate steps to verify claimed assets before importation, rather than trying to correct a problem after a violation occurs. If bond payments are required for a given manufacturer, the bond would need to be in place for any 2010 model year engines introduced into U.S. commerce on or after January 1, 2010.

2.10.3 Restricted model year

What Commenters Said:

Regarding restrictions related to naming model years, CARB commented that it believes it is reasonable to require that model year engines and equipment may be at most one year earlier than the calendar year of the importation during the change of the emission standards. Whichever requirements EPA chooses to adopt, CARB recommended that procedures be adopted to prevent any stockpiling of engines that could be used to circumvent the regulations.

EMA commented that the proposal's requirement that imported engines be identified by either model year of importation or one model year earlier is a viable and appropriate approach to preventing the stockpiling of older engines/equipment. However, given the seasonal nature of lawn and garden products, there are limited situations where the one year limitation could be too restrictive. Accordingly, EMA commented that EPA should give itself the authority to extend the time frame in special circumstances. (See §90.616 and §1054.695(b).)

In later comments, EMA suggested that we allow an additional year for products that were produced in the United States, exported, and subsequently are imported again into the United States.

Letters:

Commenter	Document #
CARB	0682
EMA	0691
EMA	0808

Our Response:

We are adopting the proposed provisions, as supported by the comments. We are not adopting the suggested allowance for approval under unique circumstances to allow a longer time frame to import products from earlier model years. We believe any such provision would invite any number of requests, each with unique circumstances. It is difficult to imagine a test that would allow us to establish a threshold that would appropriately differentiate legitimate requests from those that could or should have been avoided. In contrast, we believe the one-year allowance provides a generous amount of time to complete production for filling orders and shipping products to the United States.

While the allowance is for a one-year difference between calendar year and model year, it is important to clarify that 12 months is the minimum time interval that would apply. This would be the case, for example, for an engine produced in December 2009 with new emission standards applying for the 2010 model year. Manufacturers would then have twelve months for shipment to an equipment manufacturer for installation and importation into the United States (or importation of the loose engine). Especially with the awareness that new emission standards have taken effect, we believe this presents a reasonable deadline for manufacturers to complete their production and shipping to get products into the United States. If manufacturers end their

model year before December of a given year, that would provide an additional margin for importing products by the end of the following calendar year. For products manufactured before the end of the model year, there would also be a correspondingly longer time until the importation deadline would apply.

We are aware that seasonal products may pose unique challenges. However, we are not adopting a requirement that products reach the ultimate purchaser by the end of the calendar year following the named model year. Rather, these products must simply be imported before the deadline applies. We would expect manufacturers, distributors, or dealers to maintain their normal inventories of unsold products at their facilities within the United States without regard to the importation deadline described here.

We believe it is also not appropriate to modify the regulation to accommodate products that are exported and are later imported. We believe this represents a rather unusual scenario, since it would be limited to products that are certified and labeled for current EPA standards even though they are exported. The engines or equipment would then need to be unused for more than a year before being sent back to the United States. Adopting such an exception would likely also be contrary to policy requirements related to international trade, since it would apply preferential treatment to domestically produced engines.

See Section 1.5.2 for a discussion of issues related to stockpiling engines and equipment.

2.10.4 Adding or changing governors

What Commenters Said:

EMA noted that the majority of all nonhandheld engines in this category have speed control governors, including engines used in small utility vehicles and go-carts. Because such engines have a high potential for over speed (operation at a speed higher than the intended design of the engine), such governor systems are critical to the safety and structural integrity of these engines. Parties that modify engines to replace or eliminate the use of an engine manufacturers speed control governor should be considered the manufacturer and should be held responsible for all aspects of the resulting product, including emissions compliance. In cases where an engine modification is an engine manufacturer approved configuration, the engine manufacturer must include this configuration in its determination of a worst case emission configuration for certification. Accordingly, EMA commented that no additional compliance determination should be required.

EMA commented on §1054.650 “What special provisions apply for adding or changing governors?” EMA noted that this section states that the special provisions in the section apply for engines that will not have constant-speed governors when installed in equipment. However, there is no definition of what constitutes a “constant-speed governor.” Accordingly, EMA commented that EPA must provide such a definition in order to provide manufacturers with the ability to determine when the special provisions apply.

Letters:

Commenter	Document #
EMA	0691

Our Response:

We disagree with the comment suggesting that manufacturers simply include the range of governor strategies in an engine family by testing the worst-case configuration. The duty cycles we specify address only constant-speed engine operation. This is typical of generators, lawn mowers, and most other types of equipment. However, there are certain applications for which there is a governor to prevent overspeed but otherwise allows for operation at a wide range of engine speeds. It is not possible for manufacturers to consider the in-use operation of these variable-speed engines as part of its certification demonstration because we provide no standardized procedure for quantifying the emissions effect of this different operation. We have adopted a requirement in §1065.10(c)(1) to address this kind of mismatch between an engine's in-use configuration (or operation) and that reflected in the certification test; this requires manufacturers to notify us of the mismatch and allows us to work out an alternate testing regimen to reconcile the discrepancy. We believe it is better to address this scenario directly in the regulations rather than attempting to resolve it over time under the provisions of §1065.10(c)(1). We could adopt a unique duty cycle for variable-speed engines. However, we believe these engines make up a very small portion of overall sales of Small SI engines and that it is therefore more appropriate at this time to require manufacturers to make an engineering demonstration that emission controls continue to work effectively at different engine speeds. We may pursue a different duty cycle in a future rulemaking if we find that this approach is not an effective way of addressing the concern.

We agree that we need clarifying language to make clear what the regulation means by referring to constant-speed governors and have revised the language accordingly.

We also agree with EMA's suggestion to disallow removal or modification of installed governors without recertifying the engine. We have revised the language in §1054.650 to reflect this change.

2.10.5 Competition exemption

What Commenters Said:

OPEI commented that it agreed with EPA's reasoning and logic for determining what a "competition" engine is and how to apply for exemptions for their sale and use.

Briggs and Stratton noted that in the current small engine regulations (40 CFR Part 90) an engine "Used solely for competition" is defined as ". . . exhibiting features that are not easily removed and that would render its use other than in competition unsafe, impractical, or highly unlikely" (40 CFR Part 90.3). In the Phase 3 proposal EPA is taking a different approach as described in the preamble on page 28140 in the Federal Register. The engines must meet all four of the listed criteria to be considered exempt based on use solely for competition. In order for

new engines to be exempt per §1054.620 an engine manufacturer would have to annually apply for the exemption and provide the information as required by EPA.

Briggs and Stratton raised the following specific issues with regard to the proposal:

1. Manufacturers that make engines specifically designed for competition have made investments to develop a product to comply with the criteria under existing regulations. The proposed regulations in §1054.620 create additional certification requirements, business limitations, and recordkeeping burdens in addition to the investment already made to comply with the current regulations. Briggs and Stratton suggested that the regulations allow engine makers to either meet the new criteria in §1054.620(c) or the existing criteria, which is: "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".

2. The criteria in §1054.620(c) are written assuming that only professional racing teams use small engines for competition. However, amateurs competing in sanctioned events do much of the competitive racing using small engines. Therefore, Briggs and Stratton commented that the limitation for sale to the general public in §1054.620(c)(1) is not practical and this requirement should be deleted.

3. The requirements to "document the ultimate purchaser" and "any equipment manufacturers requests for an exempted engine" in §1054.620(g) are not practical. As discussed above, amateurs that purchase engines through dealers serving the racing market perform much of the racing in sanctioned events. Dealers do not necessarily build the equipment but supply the parts used by amateur racers and engine/equipment builders that serve the racing market. Briggs and Stratton commented that §1054.620(g) should be modified to read: "If we request it, you must provide any information we need to determine whether the engines are used solely for competition. This would include any documentation regarding the number of engines and a list of the engine manufacturers' customers for these engines. Keep these records for five years."

4. Section 1068.235 allows engines to be modified for competition after they are placed into service, to be modified without request, and no record keeping of these engines is required by the original engine manufacturer. Briggs and Stratton commented that §1068.235 should clarify that this exemption should not be used to circumvent the requirements of 1054.620.

Letters:

Commenter	Document #
OPEI	0675

Our Response:

The existing definition under part 90 is very broad. Under the current program, manufacturers would need to show only that an engine or equipment has features that make noncompetition use impractical or unsafe. We believe this allows far too much discretion for manufacturers to claim product as being limited to competition purposes. There is also not any process under part 90 for EPA to review these determinations. We proposed a set of qualifying criteria and limitations and a corresponding process to approve a manufacturer's use of this exemption. We believe these changes are needed to prevent exempted or excluded competition engines from being used for noncompetition purposes. The proposed provisions are very similar to those proposed or adopted in our other programs.

The proposed criteria to qualify for the competition engines are explicitly not limited to professional racing teams. We proposed to allow for sales to "professional competition teams, professional competitors, or other qualified competitors." We also proposed an approval process in which we could approve a competition exemption for manufacturers who could provide clear and convincing evidence that an engine would be used solely for competition even if not all the proposed criteria would apply. With respect to displaying competition models for sale to the general public, we believe it is important to avoid a situation where "unqualified competitors" are led to believe that they can purchase competition engines. It is therefore appropriate to keep the proposed limitation to prevent the "display for sale" of competition models. Allowing manufacturers to offer competition models for sale to the general public would prevent EPA and manufacturers from ensuring that purchasers will limit their use of these engines to sanctioned racing events. Manufacturers or dealers may display competition models to promote noncompetition models where it is clear that the competition models are not for sale to the general public. Qualified competitors should not be dependent on a manufacturer's marketing to the general public to be able to find the engines and parts they need. We have modified the regulation to clarify that competition engines may be displayed at a public dealership, though they may not be displayed as a sales item.

We agree with the suggestion to clarify that the allowance to modify certified engines to be used solely for competition should not be used to circumvent the requirements that apply under §1054.620 or similar provisions in other standard-setting parts. We have modified the language in §1068.235 to reflect this change.

2.10.6 Alternate fuels

What Commenters Said:

OPEI and EMA supported EPA's proposal that parties converting engines from a certified configuration to a non-certified configuration (i.e., from gasoline to propane) be required to certify the final product. OPEI and EMA commented that such parties should also be required to either remove or cover the original certified engine manufacturer emission compliance label with their own emission compliance label. As prescribed by the regulation, the party that certifies the final product should assume all responsibility for emission warranty, either directly or by contract with the original engine manufacturer.

EMA commented on §90.1003(b)(3)(i) and said that the language does not make sense and must be clarified. Significant components removed in the conversion process, such as carburetors, are not reinstalled but replaced in the conversion process. EMA also commented on §90.1003(b)(3) (ii) and believes the reference to §1054.635 is incorrect. EMA commented that the correct reference should be to §1054.645.

Letters:

Commenter	Document #
OPEI	0675
EMA	0691

Our Response:

The regulatory language in §90.1003 already refers to replaced components, as suggested in the comment. However, we believe the wording should be revised to address this confusion. We have therefore revised the language in §90.1003 accordingly. The revised language also includes a corrected reference to §1054.645.

2.10.7 Hardship exemption

What Commenters Said:

OPEI strongly objected to EPA's suggestion in the preamble that the proposed hardship relief measures in the Phase 3 regulation could somehow moot the independent need for the equipment-transitional flexibility program described above. Both proposed elements are critical to the industry and to the effective implementation of the final program. Moreover, there is substantial risk and uncertainty that EPA would not grant hardship relief requested by an individual OEM, at least until it is too late. By the time a manufacturer is in such duress that he can demonstrate and obtain hardship relief, it will typically be too late for him to make the needed production changes to avoid substantial economic injury.

In its other regulatory programs, EPA has never indicated that the hardship relief was linked to, or somehow mooted the need for, the much broader, existing transitional flexibility programs for equipment manufacturers. This is because the hardship relief provisions are limited to extraordinary circumstances and require substantial administrative time and effort to obtain. For example, both the diesel engine regulations and the general provisions applicable to diesel engines, large spark-ignited engines (LSI), snowmobiles and off-road motorcycles include an independent hardship relief variance request for non-integrated equipment manufacturers. See §89.102(f); and §1068.255. For example, the Tier III and Tier IV diesel regulations allow for an additional 70% allowance for OEMS that demonstrate hardship relief. See §89.102(f) and §1039.625(m).

Letters:

Commenter	Document #
OPEI	0675

Our Response:

EPA agrees that the TPEM program and hardship provisions are both needed for the Phase 3 program. The hardship provisions are intended to help manufacturers that are facing economic hardship as a result of not being able to comply with the new standards. The criteria for qualifying for hardship are set at a relatively high level, which would likely be difficult for a manufacturer to demonstrate if they were having difficulty redesigning only a few of their equipment models. The TPEM program allows an equipment manufacturer to deal with the models which are difficult to redesign without having to demonstrate that the company would experience hardship without the relief. Therefore, EPA agrees that both the TPEM program and the hardship provisions are needed and is retaining both of them for the Phase 3 program.

2.10.8 Stockpiling provisions for engine manufacturers

What Commenters Said:

EMA shared that there is a general understanding that the inventory allowances described in §90.1003(b)(4) apply equally to engine manufacturers and equipment manufacturers. They also pointed out that it is not uncommon in the Small SI engine business for OEM's to order engines based on sales projections and then return engines or cancel orders after the engines are built if market conditions change.

In response to draft language that would clarify the extent to which we would accommodate extended inventories for engine manufacturers, EMA commented that this approach seemed acceptable, with a remaining concern that the provision should not focus on small engine families. Engine families can consist of a wide variety of engine models/configurations. A high-volume family may include all the various models a manufacturer produces of vertical-shaft single-cylinder engines with a given displacement. The various models or customer-specific features may be as significant as a different crankshaft or as minor as a different styling element. Just because the family is high-volume doesn't mean that engines with a specific customer feature will not be stranded due to unforeseen changes in the market. Changing engines once they are manufactured and placed into inventory range from moderately expensive (trading out external parts) to ridiculously expensive (exchanging crankshafts). EMA suggested the regulatory language should state: "We will generally allow maintaining extended inventories only for unforeseen changes in market demand."

Letters:

Commenter	Document #
EMA	0817

Our Response:

The issue raised by the commenters is being addressed by adding §1068.103(f) to explicitly prohibit stockpiling engines when new emission standards take effect and adding §1054.601(b) to explain how §1068.103(f) will apply for Small SI engines. The provisions of the new §1068.103(f) clarify that what is prohibited is for engine manufacturers to deviate from normal production and inventory practices to stockpile engines with a date of manufacture before new or changed emission standards take effect. This recognizes that typical production practices for most engine manufacturers involve engines remaining in the manufacturer's inventory for some time. For most engines (especially for larger engines), since it is not economical to maintain a significant number of engines in inventory long after the end of a model year, this inventory time would typically be no more than a few weeks.

However, Small SI engines can be kept in inventory for much longer times, especially for small volume engine models. Manufacturers noted other possible cases for such extended inventories. In response to these concerns, we are adding §1054.601(b) which describes how §1068.103(f) will apply for Small SI engines. This provision does not preclude manufacturers from keeping engines in inventory for long times. However, in recognition that normal Small SI practices can include keeping some engines in inventory for a *very* long time, §1054.601(b) will require that manufacturers obtain our approval to keep any engines in inventory for longer than 12 months. Such manufacturers would be required to show that keeping such extended inventories is consistent with its normal business practice. In addition, given the lead time provided when we adopt new standards, we are requiring the manufacturer to demonstrate that the extended inventory (beyond 12 months) is also necessary and could not have been avoided through prudent planning. Consider the following examples:

Example #1 – the manufacturer normally keeps certain small volume engines in inventory for up to three years. In this case, the manufacturer would need to plan its production run of such engines so that it reasonably expected to not keep any of the engines in inventory for more than 12 months after the new standards took effect.

Example #2 – the manufacturer normally keeps engines in inventory for up to six months. In this case, the manufacturer could keep the engines in inventory for up to six months after the new standards took effect without seeking EPA approval.

Example #3 – the manufacturer normally keeps engines in inventory for up to ten months, but receives a return of a large number of engines (unforeseen but consistent with its normal business practice) so that it will not use up its inventory for an additional four months. In this case, the manufacturer could keep the engines in inventory for up to 12 months after the new standards took effect without seeking EPA approval. Engines remaining in inventory after 12 months could be scrapped, sold as replacement engines, exported, or covered under another applicable exemption. Alternatively, the manufacturer could ask to be allowed to sell the engines under its original certificate beyond the 12 month period.

It is worth noting that this 12 month limit is consistent with the provisions of §1068.360 which prohibit the importation of new engines and new equipment in any calendar year that is more than one year after the named model year.

2.10.9 Other issues under part 1068

What Commenters Said:

OPEI generally supported the proposed application of the Part 1068 Compliance Provisions to small engines. OPEI generally supported EPA's efforts to modify Part 1068 to accommodate the application of evaporative standards which create different compliance obligations – depending on whether the OEM certifies or merely installs a previously certified evaporative component. (OPEI commented that they would like to work with EPA to further simplify/clarify this program so the component suppliers and OEMs can more readily understand their obligations and liabilities.)

In response to EPA's request for comment on applying these proposed requirements for engine rebuilding and maintenance to the engines and vehicles subject to this rulemaking, OPEI commented that it believes EPA may be creating burdens on industry segments unaware of this rule and incapable of providing the amount of burdensome records required by this part. OPEI commented that EPA should exempt engines/equipment subject to part 1054 from this provision.

Letters:

Commenter	Document #
OPEI	0675

Our Response:

We agree that the provisions in part 1068 can and should apply broadly to engine categories, including Small SI engines.

We also agree that the recordkeeping provisions related to rebuilding should apply differently for handheld and Class I engines. Commercial rebuilding for these engines is quite rare. We are concerned that applying the recordkeeping requirements for these engines will not be very meaningful for EPA's oversight, and rebuilders could in many instances be unaware that their service has reached a point that would qualify as a rebuild and that recordkeeping requirements would therefore apply. These engines also generally have very simple systems for controlling emissions, so there is less of a need to carefully document part numbers for replaced components and other related records. We are therefore modifying the regulations to waive the recordkeeping requirement for engines with displacement below 225 cc. Note, however, that the underlying requirement to rebuild engines to the original certified configuration continues to apply. This requirement is simply an elaboration of the general prohibition against tampering with certified engines. Even small businesses rebuilding small numbers of small engines should not be exempt from the tampering prohibition.

In contrast, Class II engines (at or above 225 cc) are substantially more expensive and are much more likely to be used in commercial applications where commercial rebuilding can be expected to extend the engine's operating life. We believe that commercial entities rebuilding these engines can be expected to maintain a standard business practice involving more careful documentation of their work.

As described in Section 1.5.5, we believe this distinction for rebuilding engines below 225 cc should apply equally to all spark-ignition engines (including recreational vehicles and outboard marine engines).

2.11 Small business issues

What Commenters Said:

Although ECO believes that small volume engine manufacturers require flexibility to remain competitive in the market, ECO commented that it does not agree a complete pass on PLT testing is the correct approach. Instead, ECO encouraged EPA to develop an approach that maintains the integrity of the certification compliance process, while providing small volume manufacturers the flexibility needed to remain competitive. As a minimum requirement, ECO commented that at least one engine per family, per year, be tested to demonstrate ongoing compliance of production engines. As a second alternative, ECO suggested that EPA allow small volume engine manufacturers to utilize the use of alternative testing methods (portable emissions analyzers) to demonstrate in-use field testing compliance for production units.

Letters:

Commenter	Document #
ECO	0712

Our Response:

As part of the process of developing provisions for small businesses during the proposal, EPA identified 10 small businesses that are also small SI engine manufacturers. Based on estimated sales from the certification records, there companies represent less than 0.5% of small engine sales. The cost of performing testing for a PLT program are significant, especially for small companies that typically do not have their own emissions facility and must test at an independent lab. Even if we were to allow use of a portable system, the cost of such systems are still fairly expensive for the limited testing they would be used for. Due to the cost of running a PLT program and limited emission impact such a program could potentially have, we continue to believe that small volume engine manufacturers should be exempt from PLT testing.

2.12 Other issues

2.12.1 In-use testing

What Commenters Said:

NACAA noted that data available in the EPA docket indicates in-use compliance failures by various models of lawn and garden equipment. This has been a continuing concern of NACAA and is heightened by the fact that EPA did not propose a mandatory in-use testing program for these engines. NACAA urged EPA to consider the addition of such an in-use testing program, consistent with the requirements for outboard and personal watercraft engines, to ensure in-use performance at the levels envisioned by the regulation.

The Pennsylvania DEP noted that EPA has not proposed an in-use testing program for small spark-ignition engines despite the fact that in other recent proposals, EPA has treated in-use compliance as an important part of EPA's program for ensuring performance throughout the useful life. The Pennsylvania DEP commented that EPA should consider an in-use compliance program.

The MARC AQ Forum commented that the rule should establish a testing program to ensure that small engine emissions controls do not fail prematurely.

NESCAUM commented that it is essential that the engines affected by this rulemaking meet the applicable standards for the entire useful life of the equipment into which they are installed. Consequently, they believe the proposed requirements for verifying durability of emissions controls are inadequate, principally because there are no requirements for in-use emissions testing. Consistent with the durability requirements pertaining to OB/PWC engines, NESCAUM urged EPA to incorporate similar requirements for manufacturers of small SI engines and equipment, including a robust in-use testing program.

The Wisconsin DNR commented that EPA should consider the addition of a mandatory testing program for various models of lawn and garden equipment, to ensure in-use performance at the levels envisioned by the regulation.

OPEI noted that handheld engines are very difficult to test. OPEI requested that EPA provide more detail in §1054.401 of the regulations. For example, OPEI asked whether EPA will use the same test method and fuel for an in-use test as for certification. In addition, they asked if EPA will use the same fixtures the manufacturer used. OPEI suggested that language be added stating that EPA would test at the manufacturer's facility or request such fixtures from the handheld engine manufacturer.

EMA commented on §1054.401 of the regulations. They believe this section should clarify that EPA will use the same test method and fuel as used for certification by the engine manufacturer. Accordingly, EMA commented that this section should be revised to read as follows: "We may perform in-use testing of any engine or equipment subject to the standards of this part using the test procedures and test fuels utilized by the manufacturer during the certification process."

Letters:

Commenter	Document #
NACAA	0651
Pennsylvania DEP	0676
MARC AQ Forum	0696
NESCAUM	0641
Wisconsin DNR	0663
OPEI	0675
EMA	0691

Our Response:

In response to the comments recommending an in-use test program for Small SI engines, EPA is not adopting such a program in the final rule. EPA did not propose an in-use test program as part of the proposal and therefore it is difficult for us to adopt such a requirement without a chance for people to comment on the specifics of an in-use testing program. Given the large numbers of engine designs currently certified, and the wide range of applications into which those engines are placed, designing a testing program to gauge the performance of in-use engines and equipment would not be an easy task. Plus, there could be significant costs associated for manufacturers in running such a program depending on how the program is designed. EPA believes an in-use program for Small SI engines is something that should be given full consideration as part of a future rulemaking.

While an in-use test program could be a useful tool to determine whether in-use engines/equipment are complying with the standards, it is not the only way. In addition to certification testing, EPA requires manufacturers to perform production line testing to demonstrate that engines coming off the production line are emitting at the expected levels. Furthermore, EPA has the authority to perform selective enforcement audit (SEA) testing where engines coming off the production line are tested with EPA in attendance for the testing. Finally, EPA recently initiated its own on-going confirmatory test program that is expected to test a wide range of small engines in the coming years (not necessarily including engines that have already been placed into service). While none of these programs on their own can ensure engines will meet the standard in use, each will help to encourage manufacturers to produce well-designed engines that continue to meet the emission standards throughout their lifetime.

In regard to the comments that EPA should provide more details on how it would perform its own in-use testing, EPA has made one change to §1054.401 of the regulations. The regulation notes that EPA will consult with the manufacturer as needed to be able to perform a valid emission test. To the extent that engines can't be tested without unique fixtures or other approved "special test procedures" (see §1065.10(c)(2)), we would generally duplicate the methods used by the manufacturer for certification testing. This could involve testing at the manufacturer's facility or at any test facility we designate. This intent to duplicate the manufacturers' procedures does not apply for approved "alternate test procedures" for in-use testing (see §1065.10(c)(7)). Alternate test procedures are approved by EPA because they are expected to result in emission levels similar to what would result from the standard test

procedure. Therefore, although we may choose to do so, EPA sees no reason to commit to using an "alternate test procedure" for testing in-use engines.

With regard to test fuel used for in-use testing, EPA has made a change to the regulatory provisions. As described in Section 2.5.4, we are finalizing provisions that will allow manufacturers to use a 10 percent ethanol blend for certification testing for exhaust emissions from nonhandheld engines, as an alternative to the standard test fuel (Indolene). This option to use a 10 percent ethanol blend for certification of nonhandheld engines will begin with the implementation date of the Phase 3 exhaust standards and would apply to production-line testing as well. We are also committing to using a 10 percent ethanol blend for all confirmatory testing we perform for nonhandheld engines certified on the ethanol blend, under conditions specified in Section 2.5.4. Our commitment to test on an ethanol blend for those nonhandheld engines certified on an ethanol blend has been noted in §1054.501 of the regulations.

For handheld engines, we are not committing to using the same fuel as the manufacturer used for certification testing. EPA would expect to use Indolene for all in-use testing of handheld engines, although we could decide, at our own discretion, to do exhaust emissions testing using the certification fuel used by the manufacturer.

With regard to the fixtures used for testing handheld engines, EPA has not made any changes to the regulations. For any in-use testing, EPA would expect to contact manufacturers to ensure that we are testing engines in a manner that is appropriate for operating the equipment on an engine dynamometer. While this may include requesting a fixture from the engine manufacturer, EPA does not believe this will always be necessary and will not commit to doing so at this time.

2.12.2 Voluntary green labeling program

What Commenters Said:

NESCAUM commented that they support the concept of a "green labeling" program, as a means to make consumers aware of which engines exhibit especially clean emissions performance as consumers make their equipment choices. In the Phase 2 rulemakings for handheld and nonhandheld SI engines, EPA committed to "pursue the development of a voluntary green labeling program for small SI engines as a non-regulatory program." NESCAUM noted that more than eight years have now elapsed since EPA made this commitment and as yet, there is no such program. NESCAUM urged EPA, through this rulemaking, to renew its commitment to work with stakeholders to develop a green labeling program.

Letters:

Commenter	Document #
NESCAUM	0641

Our Response:

EPA is not prepared to commit to developing a voluntary green labeling program for the Phase 3 standards at this time. In several previous rulemakings, EPA has adopted provisions allowing manufacturers to certify to "Blue Sky" standards in the nonroad diesel, marine diesel, and large SI categories. These Blue Sky standards are more stringent than the regularly applicable standards and allow manufacturers to note such compliance on the engine label. While we have had such standards in place since 1998, no manufacturer has yet certified an engine under these standards. Therefore, while we could consider a voluntary labeling program, we are not convinced that manufacturers are interested in participating in such a program. While EPA could pursue a voluntary program in the future, we are not committing to developing a program for the Phase 3 standards in this rule.

2.12.3 Miscellaneous Issues

What Commenters Said:

EMA commented that §1054.15(b) "Do any other regulation parts apply to me?" states that Part 1065 describes procedures and equipment specification for testing engines. However, Part 1065 only provides this information regarding exhaust emission testing, not evaporative emission testing. Accordingly, EMA commented that this section should be revised to read as follows: "Part 1065 of this chapter describes procedures and equipment specifications for exhaust emission testing engines. Subpart F of this . . ."

EMA noted that §1054.101(b) states that HC and NOx exhaust emissions are optional for wintertime engines. However, §1054.101(d) states that two-stroke snowthrower engines may meet exhaust emissions standards that apply to handheld engines with the same engine displacement. In order to avoid any confusion between the requirements set forth in §1054.101(b) and (d), EMA commented that §1054.101(d) should be revised to read as follows: "Notwithstanding the provisions of subpart (b) of this part, two-stroke . . ."

EMA commented on §1054.205(a) "What must I include in my application?" EMA commented that it is not clear what information is required for engine families where the certification test engine has a maximum modal power in excess of 15 kW. Accordingly, this section should be revised to read as follows: "For each engine family in which the maximum modal power of the emission-data engine is at or above 15kW, provide the nominal brake power for engines included in the engine family as described in 40 CFR Part 1054.140."

EMA commented on §1054.235(e) "What exhaust emission testing must I perform for my application for certification of conformity?" EMA noted that pursuant to this section, EPA may require a second engine to be tested. However, the section fails to define how the "official" results of such testing will be determined. EMA recommended that EPA's current practice – which is to use the average of the results obtained – be included in the final rule.

G. Alcock commented that there is a very important overriding consideration regarding all leaf blowers. The particulates sent into the air in the process of 'blowing' far outweigh the combustion output as regards overall pollution. Leaf blowers should be banned entirely. Leaf vacuums are far more efficient and could even be restricted to electrical power sources. All homes have external electrical outlets. To limit the financial business loss of leaf blower manufacturers (which should not be the criteria by which laws are considered) would be the conversion of leaf blowers to vacuums. Innovation would allow designs for these modifications and a much cleaner environment would result. In Arizona's attempts at legislation, the ban was immediately thrown out because it would hurt the manufacturer of leaf blowers. This is the tail wagging the dog. They said use of leaf blowers would be limited to high pollution days. Every time a leaf blower is used the local area becomes a high pollution day.

Letters:

Commenter	Document #
EMA	0691
G. Alcock	0601

Our Response:

We agree that §1054.15(b) should be changed to focus on exhaust emissions. The regulations have been changed accordingly.

We agree that §1054.101(b) and (d) from the proposal need to be reconciled. We have combined these into a single paragraph and added the clarification that the handheld HC+NOx standards apply to the two-stroke snowthrower engines if they are certified to the handheld standards.

We believe the proposed requirement to identify maximum engine power for engines with maximum modal power over 15 kW is exceptionally clear. Maximum engine power is a defined term (see §1054.140), as noted by EMA's comments on that subject. Maximum engine power is the parameter used to determine whether engines are subject to the requirements of part 1054, so any other information would not be suitable for identifying the engine family in §1054.205(a). Note that we are revising the regulation to require reporting of maximum engine power for engines with displacement at or below 1000 cc only if maximum modal power is at or above 25 kW.

We disagree with EMA's suggestion that we should specify in §1054.235(e) that the results from a second engine tested by the manufacturer should be averaged with the results from the first engine to determine the official result for the engine family. The regulations at §1054.240(a) specifically state that all engines tested for certification need to comply with emission standards. Allowing the averaging approach would allow manufacturers to have a test engine with emissions above the standard that is offset by an engine from the same family that has lower emissions. This is clearly incompatible with the principle that the test engine needs to represent the worst-case configuration and that every engine produced under the engine family must meet emission standards. This is consistent with the current regulations at §90.104(a), which also require that all test engines meet applicable standards.

We understand that there are certain quality-of-life concerns regarding the use of Small SI engines. We encourage the responsible use of leaf blowers and other types of equipment that may be operated in neighborhoods or in other areas where people may be sensitive to the use of such equipment. However, the Clean Air Act directs us to set emission standards for these products without giving us the authority to limit the use or sale of these products.