Summary and Analysis of Comments: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder

Chapter 4
Certification and Compliance Program

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

United States
Environmental Protection
Agency

EPA420-R-08-006
March 2008

4 CERTIFICATION AND COMPLIANCE PROGRAM

What We Proposed:

The comments in this section correspond mainly to Section IV of the preamble to the proposed rule, and are therefore targeted at certification and compliance. A summary of the comments received, as well as our response to those comments, are located below.

4.1 1068 and General Compliance Provisions

4.1.1 Production Line Testing (PLT) and Selective Enforcement Audit (SEA)

4.1.1.1 General

What Commenters Said:

The Engine Manufacturers Association (EMA) commented that it has been engine manufacturers' experience that the cost of the production line testing (PLT) program far outweighs any potential benefits; the commenter recommended that the PLT program be eliminated completely for marine engines. The commenter stated that certification testing is extremely expensive, and certification test cell resources are extremely limited and should be utilized for new product development (including emission reduction programs) rather than a quality control program. The commenter also noted that for compression ignition (CI) engines, PLT requirements are found only in the locomotive and marine regulations. EMA noted that its members have compiled the costs associated with the PLT program and found that those costs exceeded $620,000 in 2006 (based on 92 PLT audits involving more than 144 test cell days), with a net result of one (1) PLT 'failure,' which was readily addressed. EMA commented that if EPA does not eliminate the PLT program for marine engines, it believes that EPA should provide a detailed cost-benefit analysis of such a program. Additionally, EMA commented that if EPA does not eliminate the program, a more cost-effective program, one similar to that proposed by EMA during the rulemaking development, should be adopted. They also offered a specific recommendation for a lower testing rate. EMA also offered additional factors which it believes support the elimination of the PLT program, including: that the marine rule contains selective enforcement audit (SEA) provisions, that the vast majority of marine engine families are derivatives of other higher volume engine families which have manufacturer self-audit programs, and that CI engines are often tested at a rate of 100 percent to assure basic engine performance characteristics.

Manufacturers also commented that the requirements of PLT and in-use testing are currently large and growing burdens for locomotive certification. The commenter stated that it believes that these requirements should be eliminated on all switcher locomotives, not just those

that use non-road certified engine configurations. Without this change, the commenter stated, engines developed for locomotive switching operations will be discouraged in favor of switchers using nonroad cycle-certified engines. The commenter further noted that PLT burden could lead to switcher engine and locomotive manufacturers avoiding the route of developing engine and control systems truly optimized for locomotive use.

Electro-Motive Diesel, Inc. (EMD) noted that in the formation of Part 92 in the original locomotive rule, industry urged EPA not to implement selective enforcement audits (SEAs), and EPA listened and understood. The commenter stated that it believes that an SEA program is not necessary for locomotives, and it is concerned that EPA has proposed an SEA program for the Tier 4 program.

The Association of American Railroads (AAR) commented that it objects to EPA's apparent proposal to expand the production line testing (PLT) program to include non-certifying railroads.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0591.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502 (hearing), 0505, 0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We believe that some testing of production engines is generally required to ensure that engines are being produced consistent with the certificate of conformity. It does no good to require a manufacturer to certify an engine design for an engine family, if the engines do not conform to that certificate when they are produced. In the past, we have relied on SEAs to ensure production quality. In the SEA program, EPA audits the emissions of new production engines by requiring manufacturers to test engines pulled off the production line on short notice. This spot checking approach relies largely on a deterrence strategy. We now believe that a PLT program is generally more effective, and less burdensome than frequent SEAs. Manufacturers already design into their production processes steps necessary to make sure their engines are properly produced. Emission testing can generally be designed into that process with limited burdens. Thus, we disagree with the comments suggesting that PLT is not necessary or that it is excessively burdensome. We also do not agree that a one percent testing rate is too high. Since we are not changing the default PLT programs for either locomotives or marine engines from those already existing, we see no basis for conducting a detailed cost benefit analysis.

Just as with the regulations in Parts 92 and 94, we have included in Parts 1033 and 1042 specific authority to allow manufacturers to develop their own methods of ensuring that the engines are being produced to comply with the emission standards. Thus, while we disagree with manufacturers claiming the program is too burdensome, we allow them to develop less burdensome alternatives. To help them reduce their burden, we are adopting a specific alternative that would allow them to use field-grade measurement systems with a slightly higher

sampling rate. Under this option, manufacturers would be required to double their initial sampling rate. The number of additional engines that would need to be tested for each test failure would be the same as in the main program.

We disagree with manufacturers that switchers should be subject to less compliance testing than line-haul locomotives to incentivise their certification as locomotives. We believe that manufacturers will choose the interim nonroad engine certification route unless the customer demands Part 1033 locomotive certification. Thus we do not believe that incentive or disincentives for the engine manufacturer will be of primary importance.

We are modifying the regulatory text of §1033.601 to be clear that the SEA provisions of Part 1068 do not apply for locomotives. This is to be consistent with the approach adopted in Part 92, which did not subject locomotives to SEAs.

In response to AAR's comment, we are changing the example in §1033.1, which could have been read to imply that non-certifying railroads are required to perform production-line testing. That was not our intent.

4.1.1.2 Engine and Catalyst Stabilization

What Commenters Said:

EMD commented that it believes that EPA's proposed provision that the final test result from multiple tests on a PLT locomotive or marine engine should be the average of all of the test results should not include the results of an initial failed test on a green engine that was brought into conformity with emissions standards by degreening for up to 300 hours (for locomotives), as allowed by §1033.315(d), in lieu of using a green engine factor. The commenter noted that if the engine as received meets all emission standards, the manufacturer knows that the emissions of particulates, hydrocarbons, carbon monoxide, and smoke will decline as the engine breaks in, and the emissions of oxides of nitrogen will decrease with increasing engine hours; thus, the engine is unlikely to exceed emissions standards. The commenter stated that if the engine exceeds standards on one or more constituents, a degreening run is made to stabilize emissions.

With regard to the request for comment on whether manufacturers should be allowed to use a pre-stabilized catalyst instead of an unstabilized (or "green") catalyst and, if so, should it require some additional procedure for assuring proper in-use operation with production catalysts, EMD commented that manufacturers should be able to: test with a green catalyst, with the application of a 'green catalyst factor;' to operate the engine on its own property for the period necessary to stabilize the catalyst (though operation of engines of locomotive or Category 2 (C2) marine size for extended periods is expensive); to apply a previously aged catalyst to simulate operation in service; or, to introduce a locomotive engine to service for catalyst aging and recover it after a short interval for production line testing.

With regard to the request for comment on whether a locomotive selected for production-

line testing should be allowed to be introduced into service provided it is tested within the first 10,000 miles of operation, EMD commented that it believes that the interval of 10,000 miles is too short. The commenter stated that once a locomotive is introduced to service, recovering it can be difficult, and the locomotive could possibly be accumulating significant mileage during that time period. EMD again recommended that a mileage accumulation of 45,000 miles would be more realistic than 10,000 miles for a production line test of catalyst-equipped units.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We agree that manufacturers should be allowed to use special procedures for production line testing of catalyst-equipped engines. However, we do not agree that manufacturers should be allowed to apply a previously aged catalyst to simulate operation in service. Such an approach would not provide any information about the production quality of the catalysts or the final assembly process. We are adopting the following provisions instead.

For locomotives, the new regulations will allow a locomotive to be used in service for up to 1,000 hours of engine operation prior to testing, which we believe will be sufficient time to degreen a catalyst. We believe that this approach should work well for locomotives given the very close working relationships between the manufacturers and the major railroads.

We do not believe this locomotive approach would work for marine engines because the marine market is much more diverse and the very close working relationships cannot be assumed. Therefore, we will rely on our general authority to approve alternate PLT programs. Should a consensus develop in the future about how to appropriately verify that engines and catalysts are produced to conform to the regulations, we may adopt specific regulatory provisions to address these marine engines.

We are also continuing to also allow the conventional PLT approach for catalyst equipped engines. In that approach, a manufacturer would be required to assemble and test the engine with a complete catalyst system. At the manufacturer's choice, the engine could be broken in by operating it for up to 300 hours, or it could be tested in a "green" state and its measured emissions adjusted by applying "green engine factors".

Finally, we agree that failure of a green catalyst may warrant special consideration. As such the final regulations specify that a manufacturer may ask us to allow it to exclude an initial failed test if all of the following are true:

(1) The catalyst was in a green condition when tested initially.

(2) The locomotive/engine met all emission standards when retested after degreening the catalyst.

(3) No additional emission-related maintenance or repair was performed between the initial failed test and the subsequent passing test.

4.1.1.3 Audits

What Commenters Said:

EMD commented that the proposal carries over the audit sample size requirement of Part 92 to audit the installation of remanufacture systems at a rate of five percent of sales per year per installer, with a maximum requirement of ten per year per installer. The commenter stated that it believes that this requirement could be impossible to comply with, because an installer could purchase twenty remanufacture systems and put them all on the shelf (thus triggering a requirement under the present rule to audit one installation, but no installations would have occurred). The commenter recommended changing the audit requirement to five percent of installations per year per installer, again with a maximum of ten audits per year per installer.

EMD also commented that the proposed provision (from Part 92) that an audit be completed within 10,000 miles of remanufacture system installation to be valid is difficult to comply with, and urged that the 10,000 mile requirement be changed to 45,000 miles to make this provision more reasonable to comply with. EMD noted that proposed §1033.340(g) requires that the reports of installation audits must be submitted within 30 calendar days of the end of each quarter and requested that the §1033.340(g) requirement be changed to 45 days.

EMD commented that while the majority of remanufacture system installations occur on major North American railroads, a few occur on small regional or local railroads, incurring an audit requirement under the regulations currently in place. The commenter noted that it is very difficult for it to support the installation audit requirements on these railroads, as EMD has no service presence there, and in most cases EMD does not even sell the kit directly to the railroad (it is handled through a distributor) and that a low threshold were to be set for the installation audit requirement. The commenter further suggested that it would be de minimis to include a provision which stated, in effect, that if a Class III railroad (a local line haul or switching and terminal carrier) installed five or fewer kits in any given year, no audits of those installations would be required. The commenter lastly noted that it has kit sales of about 600 per year—adding this provision would probably mean that 10 or less installations per year would not be covered by an audit.

EMD also requested that EPA make the following changes to 40 CFR Part 92 of the regulations: 1) a revision of the remanufacture system audit sample size requirement from five percent of sales per installer to five percent of installations per installer; 2) a revision of the maximum mileage for a valid audit of a remanufacture system installation to 45,000 from 10,000; and, 3) an exclusion from audit requirements for remanufacture system installations on five or fewer locomotives of Class III railroads.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

In general, we agree with EMD's comments, and have largely incorporated them into the final regulations. However, we are not excluding locomotives owned by small railroads from the auditing requirements. While these locomotives represent a smaller part of the inventory than the larger railroads, they are still significant sources. Nevertheless, we do see EMD's point about the burden of auditing such locomotives. Therefore, the final regulations include an allowance for the railroad to perform the audit and submit it to EPA through the certificate holder.

4.1.1.4 SEA Test Location

What Commenters Said:

EMA commented that it believes the requirement to specify a test location for SEA testing in the U.S. (§1042.205(bb)(3)) imposes an unnecessary burden on engine manufacturers—the commenter suggested that it should be sufficient to specify a test location, and not specifically one in the U.S. The commenter noted that manufacturers generally have test facilities that are in compliance with the requirements for certification, and suggested that EPA accept those test facilities for SEA if necessary. The commenter pointed out that marine engine families are generally built in much smaller volumes than on-highway or nonroad engines, and it believes that this new requirement should not be added for marine engines accordingly. The commenter noted that many marine CI engines have power outputs well above the normal automotive power range, making it potentially difficult to find a US-based test facility capable of performing such testing. Lastly, the commenter noted that the cost of setups, troubleshooting, and external test support can be extraordinary compared to conducting tests within the manufacturer's typical location.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Sections 206 and 208 of the Act provide EPA with broad authority to require manufacturers to test production engines to determine whether they are being manufactured to conform to the applicable regulations. We have previously promulgated SEA regulations in Subpart E of Part 1068 under this authority. In §1068.401(b) of those regulations, we state:

> If we send you a signed test order, you must follow its directions and the provisions of this subpart. We may tell you where to test the engines. This may be where you produce the engines or any other emission testing facility.

This provision recognizes that where an engine is to be tested is an important consideration for SEAs. It can affect whether EPA can practically witness the testing to verify that it is done properly. It also can affect the degree of confidence EPA and the manufacturer have in the results. Both are more likely to have confidence in the results if they have prior experience with

the test facility. In addition, we have greater confidence in test results when they are performed under U.S. jurisdiction. For domestically produced engines, consideration of these factors makes testing at the manufacturer's facility a reasonable practice. This is not true for imported engines.

The proposed requirement to specify a test location for SEA testing in the U.S. is intended to simplify this process of determining where imported engines are to be tested. By having them name a U.S. facility in their application, we are allowing them to make whatever arrangements they feel are necessary to allow them to have confidence in the test results if we require the engines to be tested in the U.S.

We agree that testing very large engines needs special consideration. As the size the engine increases, the number of facilities that can test them decreases. This could make naming a U.S. test facility for these large engines problematic. For this reason, we are revising the proposed provision to exclude engines over 560 kW. We will still retain the authority to specify where the testing is to be performed (including whether it must be tested at a U.S. facility). Should we decide to specify a test facility other than the manufacturer's normal test facility for those engines, we would likely work with the manufacturer to select an appropriate test facility.

As for the other objections raised by the manufacturers, they are more accurately objections to the existing regulatory provision in §1068.401(b) that allows us to specify any test facility for SEAs. We did not propose to change that provision and are not revising it.

Finally, it is worth clarifying that requiring manufacturers to specify locations for SEA testing in the U.S. does not preclude us from allowing foreign manufacturers to perform SEAs at their non-U.S. production facilities.

4.1.1.5 Failure

What Commenters Said:

EMD commented that §1033.310(d), the requirement for retesting after a test failure, is ambiguous and should be reworded.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502 (hearing), 0594.1

Our Response:

It should first be noted that the EMD comment relates to an example rather than a regulatory requirement. So while we have revised this provision to make the example clearer, it does not change the requirement. See the regulatory text for the revised language.

4.1.2 Defect Notifications

What Commenters Said:

EMD commented that it believes the defect-reporting requirements of §1068.501 are unnecessary in the locomotive and Category 2 marine engine industries. The commenter suggested that EPA revert to the requirements of Parts 92 and 94. The commenter noted that the locomotive and Category 2 marine engine markets are relatively small so information flows freely because manufacturer and owner/operator personnel generally are acquainted with each other (and the latter are not reluctant to contact the former if a problem arises). The commenter also noted that frequently, manufacturer personnel are aware on a locomotive-by-locomotive, or engine-by-engine, basis of what is occurring. The commenter stated that it believes that these circumstances render it unnecessary to track such secondary indications as parts sales or quality assurance procedures in an attempt to divine whether there may be a defect occurring. Lastly, EMD commented that if EPA is unsatisfied with the level of defect reporting occurring under the rules currently in force, those procedures should be revised in a targeted manner, rather than imposing the onerous and totally unnecessary procedures of Section1068.501 on the locomotive and Category 2 marine engine markets.

General Electric Transportation (GE) commented that it believes the enforcement, defect, and recall provisions of the rule should be clear and avoid disruption to rail commerce. The commenter also stated that it believes the proposal requiring extensive tracking of information related to components triggering defect investigation and reporting should be narrowed and clarified. The commenter suggested that EPA make three changes to these provisions as they apply to locomotives (and other engines as well):

1) Limit the requirement to track and assess data to the information in §1068.501(b)(1)(I) and not impose the requirement for subparagraphs (ii) and (iii).
2) Include in paragraph (b)(1) a clear statement that subparagraph (b)(1)(iii) does not require data-tracking or recording of information related to shipment of replacement parts.
3) Clarify or delete paragraphs (b)(1)(ii) and (iii) to ensure that obligations of the manufacturer and remanufacturer are clear and that they are able to understand the specific requirements applicable to their conduct with regard to violations.

GE commented that if EPA continues these aspects of the rule for other types of nonroad engines and equipment, it is reasonable for the Agency to continue with the approach in the existing Part 92 rules for defect investigations for locomotives (and the corresponding current provisions for marine engines). The commenter noted that reliability is a hallmark of the industry, since, unlike the trucking industry, a locomotive cannot be simply pulled off the rails when a breakdown occurs. The commenter noted that locomotive builders invest substantial engineering resources in testing and validating their operations, as railroads cannot afford for a large number of locomotives to become unavailable due to the limited number of locomotives in the active fleet or to block rails due to breakdowns (the economic consequences to an individual railroad and to other railroads moving freight on the track would be too severe).

GE commented that EPA should consider, when revising this portion of the rules, that the certificate holder does not always have access to the engine or components that would be necessary to conduct a thorough investigation that, in turn, would enable the determination if an emission defect is present and/or if the failure was due to abuse, accidental damage, or other cause unrelated to the design of the engine or component. The commenter suggested that a provision be included in the regulations that allows a reasonable time period for an investigation - recognizing the burden on the railroads when locomotives must be taken out of service for an investigation - and that locomotive owners and operators should be required to cooperate with investigations and make available data and equipment requested by a certificate holder in conducting an investigation.

EMA commented that it supports the proposal to apply the defect notification requirements that are set forth in Part 1068 to marine and locomotive engines. The commenter stated that it believes that this will allow engine manufacturers to implement common defect reporting procedures for all of their nonroad engine products.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

As EMA noted there are advantages to applying the common defect reporting of §1068.501 to all engine categories. However, we also see some veracity in EMD's and GE's comment that the locomotive industry is unique in some respects. Thus, while we are finalizing the proposed provision that applies §1068.501 to locomotives, we are also specifying that the defect *investigation* requirements of 40 CFR 1068.501 should be applied "consistent with normal locomotive industry practice for investigating defects". This additional provision in §1033.601 is intended to recognize that locomotive manufacturers and the railroads have very close working relationships and have a long history of tracking and correcting defects. We are also noting that this would not require manufacturers track parts shipments as indicators of possible defects, since many more parts for remanufacturing and maintenance that because of defects. We do not expect that the application of §1068.501 as specified in §1033.601 will require manufacturers to fundamentally change their defect tracking practices.

As noted above we believe our changes to §1033.601 will mean that locomotive manufacturers will not need to make significant changes to how they track and report defects. For that reason, and because we did not propose any significant changes to Part 1068 in this rulemaking, we do not believe that we need to address here the more detailed comments raised by GE. Nevertheless, we do believe that they are worth considering and will address them along with other comments on §1068.501 in a separate ongoing rulemaking.

With respect to marine engines, we are adding a special provision for manufacturers that also manufacture other nonroad engines (including locomotive engines) that are substantially

similar to their marine engines. We will allow those manufacturers to consider defects using combined marine and non-marine families. Thus, companies such as EMD would be allowed include their Category 2 marine engines in the same defect program they use for locomotives.

4.1.3 Proposed Changes to Record-keeping and Reporting Requirements

Marathon Petroleum Company LLC (Marathon) commented that it believes EPA should note that the proposed standards put significantly more burden on owners and operators for compliance with emission limits and that this is a change from previous regulations in this sector that mainly relied on manufacturers for compliance. The commenters presented the example of the installation and operation of aftertreatment control technology for the Tier 4 standards, but did not detail how this would be a burden. The commenter stated that these requirements will increase the cost of compliance but require engine owners and operators to understand EPA regulations, thus the commenter believes that the recordkeeping and reporting burden should be minimized for marine engine owners and operators as they are not likely familiar with reporting requirements (and may have difficulty complying with the requirement to notify EPA of urea system operating incidences within 30 days). The commenter also noted that these vessels are frequently away from their home port for greater than 30 days at a time.

EMA commented that Part 1033 would require a large amount of record-keeping and reporting of information relating to PLT and in-use testing (see §1033.325(e) for PLT and §1033.425(a) for in-use testing requirements). The commenter stated that it believes that this record-keeping and reporting requirement will impose time and financial burdens on both the certificate holder and the Agency, while yielding no environmental benefits. The commenter suggested that if these record-keeping and reporting requirements cannot be eliminated completely, they should at least be reduced in size and scope. The commenter offered an example that the reporting of PLT results could be required annually instead of quarterly. The commenter also suggested the option of focusing the PLT reporting requirements on the failure of a PLT, and only require reporting if there is a failure (and no reporting if engines/locomotives pass).

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
Marathon Petroleum Company LLC OAR-2003-0190-0595.1

Our Response:

Both commenters expressed a general objection to the amount of recordkeeping and reporting required, but sited few specific examples. We are not able to analyze the general comment and can only say that we disagree with it. We are responding to the PLT-related comments in section 4.1.1 above.

We disagree with Marathon's comment that reporting operation without urea is too burdensome. Most importantly, we disagree because this reporting will only occur in cases in

which the operator violates the regulations. To whatever extent the reporting would constitute a burden, it also creates an incentive to comply with the regulations. However, we also disagree that merely sending a report constitutes a significant burden.

4.1.4 Staged and Delegated Assembly

EMD commented that the exemption provisions of 40 CFR 1068.260 (which allow shipping engines separately from their aftertreatment components) should apply for locomotives. With regard to the temporary staged-assembly exemption in §1033.630 (to allow completion of production of engines and locomotives at separate facilities), EMD commented that it believes that EPA should realize that assembly of engines and locomotives at separate facilities is routine in the locomotive industry. The commenter stated that requiring an exemption to do this ("and more egregiously, a temporary exemption") is a major disruption to the way that locomotive manufacturers have done business since time immemorial. The commenter recommended that that this section be dropped from the rule, and that the exemption of §1068.260 be allowed in the locomotive market.

GE commented that it believes EPA should clarify the proposed provision on staged assembly (§1033.630)—specifically, that it does not require an exemption for the manufacture of engines at one plant and installation in locomotives at another plant. The commenter noted the example of engines being manufactured and tested at one plant and locomotives being assembled and produced out of another. The commenter does not believe that this constitutes a stages assembly, but rather a normal manufacturing process. The commenter stated that it believes that proposed §1033.620 would apply to a situation where an engine is actually in a locomotive but requires additional work at another facility to complete a certified installation.

EMA commented that it believes that the application of the general nonroad provisions associated with delegated assembly to marine and locomotive engines is problematic. The commenter noted that for marine engine manufacturers, virtually every engine will be covered by these provisions as there are no integrated marine vessel/engine manufacturers. The commenter also noted that aftertreatment systems for marine engines generally will be integrated into the vessel design due to both space and safety considerations. The commenter suggested that the cost of the aftertreatment devices not be included in the cost of the marine engine because the engine manufacturer does not have control over the design or packaged cost of the aftertreatment system. The commenter stated that it believes that engine manufacturers should be allowed to provide the vessel manufacturer the design requirements for the aftertreatment system as certified with the prescribed installation instructions.

EMA commented that it believes that the audit requirements associated with the equipment manufacturer must be revised to be applicable to the marine vessel manufacturing industry. EMA also commented that it believes that the aftertreatment order-to-engine shipment relationship must be revised to reflect the marine industry. The commenter noted that vessel construction can be a lengthy process resulting in a significant time discrepancy between when the engine is shipped and when the aftertreatment system is ordered—engines are often ordered

and installed in the early stages of the vessel construction with the exhaust, and in this case aftertreatment system, being ordered and installed significantly later in the vessel assembly process.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We proposed to treat delegated and staged assembly differently for locomotives and marine engines because of factual differences between the two sectors; most notably the fact that we have engine-based standards for marine engines but chassis-based standards for locomotives. We continue to believe that the requirements for marine engines are sufficiently similar to other our engine-based program for other nonroad diesel engines that we should apply the same delegated assembly requirements in §1068.260. It is also important to note that we recently proposed to modify §1068.260 to address manufacturer concerns (72 FR 28097, May 18, 2007). We will continue to work with affected manufacturers (including marine manufacturers) in that rule to address their concerns.

We are modifying the provisions of §1033.630 to address the comments of EMD and GE regarding staged and delegated assembly of locomotives. We are incorporating parallel provisions in this section rather than applying the provisions of §1068.260 to locomotives. Nevertheless, we would allow manufacturers to use the provisions of §1068.260 as an option for locomotives. Although the provisions on §1068.260 are in many ways more stringent, they might represent an attractive option for manufacturers also using them for other types of engines.

We recognize that assembly of engines and locomotives at separate facilities is routine in the locomotive industry. Thus, while we believe an exemption is appropriate for this practice, we want to make obtaining such an exemption to also be routine. We have added regulatory language to allow the manufacturers to request the exemption in their applications for certification and to make approval of the exemptions automatic when we approve the application for certification. We are also clarifying that no exemption is needed if the engines are in their certified configuration and properly labeled.

While it may seem to be inappropriate to require an exemption for a routine process, this approach is necessary to allow us to effectively enforce our emission standards. By requiring pre-approval to ship locomotive engines in non-certified configurations, we prevent someone who is caught distributing nonconforming engines in U.S. commerce in violation of the regulations from claiming after the fact that they were merely shipping them to a separate location where they would be brought into a certified configuration.

It is also worth clarifying the “temporary” nature of the exemption. This language is required to be technically correct in the regulations and merely means that the exemption applies

for one step in the process. For a given locomotive, the exemption would be effective for the time between the beginning of the assembly process and the point at which it is assemble into the locomotive. The exemption does not apply after that period, and the locomotive must be covered by a certificate of conformity.

4.1.5 Replacement Engine Provisions

4.1.5.1 Marine Engines

See Chapter 3.

4.1.5.2 Locomotive Engines

What Commenters Said:

EMD noted that EPA states that the exemption provisions for new replacement engines of 40 CFR 1068.240 do not apply for locomotives; the commenter believes that an exception should be made for locomotives originally manufactured prior to 1973, as they are not governed by the locomotive emissions rule unless upgraded.

EMA recommended that EPA should provide a replacement engine provision for failed locomotive engines, at least for catastrophic failures, up to some reasonable point in the engine's life given the remanufacturing requirements. The commenter further recommended that after an engine is remanufactured to newer standards, a replacement engine provision should allow a replacement engine to be built to that newer configuration instead of only allowing engines to be built to the current new engine requirements. The commenter stated that it believes that the need for such a provision becomes very clear when dealing with a multiple engine locomotive with a single engine catastrophic failure, otherwise requiring multiple tier engines in a single locomotive would be unmanageable for the end-user.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

In both the Part 92 and Part 1033 regulations, we classify repowering a used locomotive with an unused (or freshly manufactured) engine to be a form of remanufacturing that is subject to emission standards. The existing regulations contain no replacement engine exemption, and we continue to believe that such an exemption would be inappropriate for locomotives.

With respect to pre-1973 engines, we are revising the regulations to clarify replacing the engine with a freshly manufactured engine would be considered to be upgrading the locomotive.

Such locomotives would be subject to the same Tier 0 standards as 1973 locomotives.

4.1.6 Mexican and Canadian Locomotives

What Commenters Said:

EMD and GE commented that the Notice of Proposed Rulemaking (NPRM) contains language that would prohibit designs that readjust injection timing of an emissions-certified locomotive to improve fuel consumption, at the expense of NOx emissions, when it is operating in Mexico, and reverse the readjustment to allow the locomotive to conform to all emissions standards when it returns to the United States. Both commenters believe that EPA lacks authority to do so.

EMD noted that EPA asserts that the emissions from a locomotive incorporating a global positioning system (GPS)-controlled auxiliary emission control device (AECD) would likely be harmful both to Mexican and United States citizens due to emissions transport. The commenter noted that the same is true of any locomotive operating solely in Mexico and conforming to no emissions standards, as Mexico has no locomotive emissions rules. The commenter also stated that, because of the limited range of possible injection timing adjustment (and injection timing not being the only measure used to reduce NOx emissions), the overall NOx emissions of the locomotive with the adjustment triggered by GPS data are likely to be lower than those of any nonconforming locomotive that the new locomotive would replace. EMD also commented that EPA exempts exported locomotives from the provisions of its rules, as EPA's authority does not extend beyond United States borders, and requires imported locomotives to be brought into compliance with EPA rules. The commenter stated that the locomotive with the feature that EPA seeks to prohibit is one that repeatedly exports and imports itself. The commenter noted that when it exports itself, it readjusts itself to improve fuel consumption; when it imports itself, it brings itself into compliance with the emissions standards appropriate to its date of original manufacture, or remanufacture if different, in accordance with EPA requirements.

GE stated that the interpretation stated by EPA in the preamble to the proposed rule is an assertion of extraterritorial jurisdiction that has no basis in the Clean Air Act (CAA). GE noted that it is a longstanding principle of American law "that legislation of Congress, unless a contrary intent appears, is meant to apply only within the territorial jurisdiction of the United States." EEOC v. Arabian Am. Oil Co., 499 U.S. 244, 248 (1991) (quoting Foley Bros. V. Filardo, 336 U.S. 281, 285 (1949)). The commenter stated that this principle serves to protect against unintended clashes between our laws and those of other nations which could result in international discord. GE further commented that, applying this principle to the instant case, there is no basis for concluding that Congress intended locomotive emission standards to apply when locomotives operate outside the United States. The commenter also stated that it does not agree with the statement that EPA might have jurisdiction in Mexico because these systems "cause emission exceedances when a locomotive crosses the U.S. border into a foreign country are considered defeat devices and are not permitted" (72 FR 16002). GE commented that a system cannot cause an exceedance if the locomotive is in Mexico, because Mexican law is

applicable in Mexico, not EPA locomotive rules. The commenter further stated that EPA has no basis to state that when "a locomotive is certified, it should comply with U.S. standards and requirements during all operation," when that operation might be outside of EPA's jurisdiction. GE also commented on the statement that "since emission labels have to contain an unconditional statement of compliance, non-compliant operation in any area, including a foreign country, would render the label language false, and this is not allowed." The commenter stated that, whether or not a tag on a locomotive is accurate during locomotive operation in another country violates no prohibition in the EPA rules.

The New York State Department of Environmental Conservation commented that it strongly supports EPA's clarification of the applicability of the proposed standards to foreign-owned locomotives operating in the United States.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
General Electric Transportation (GE) OAR-2003-0190-0590.1
New York State Department of Environmental Conservation, Office of Air Resources OAR-2003-0190-0583.1

Our Response:

We disagree with the commenters' claim that EPA does not have the authority to restrict the types of AECDs in question for locomotives introduced into U.S. commerce. Section 203(a)(3) of the CAA gives EPA broad authority to prohibit the installation of components that render emission controls inoperative. Neither the CAA nor the existing regulations provide any exceptions for AECDs that only operate outside the U.S. Historically, we have prohibited such AECDs because of concerns over their potential adverse impacts on U.S. air quality. Exhaust pollutants can be transported long distances, and thus, emissions that occur outside the territorial boundaries of the U.S. can impact air quality within the U.S.

While the commenters raised their concerns in the context of locomotives, we believe they potentially apply more broadly to other nonroad engines, particularly ocean-going vessels that travel in international waters. We are not finalizing any revisions to the existing regulatory provisions specific to this issue in this rulemaking. However, we do agree that there are important factors related to this issue that should be considered broadly for nonroad engines. Therefore, we expect to review this issue more broadly in the context of a future Category 3 marine rule that is currently under development by EPA. Commenters can renew their claim on this issue at that time.

4.1.7 Other Exemptions

4.1.7.1 Hardship Provisions for Locomotive Manufacturers and Remanufacturers

What Commenters Said:

EMD commented that it believes that the hardship provisions of §1033.620, which are carried over from Part 92, fail to address the real danger facing locomotive manufacturers and remanufacturers—that locomotives of one Tier might be stranded on the assembly line by an event beyond the manufacturer's control beyond the compliance date for the next Tier. The commenter noted that such events might include: a strike at the manufacturer's facility or at that of a key supplier; a fire that shuts down production, again at either the manufacturer's facility or at a supplier's; 'acts of God' (storms, floods, etc.) that shut down part or all of a production plant; and/or transportation disruption that prevents delivery of key components. EMD commented that the §1033.620(b)(1)(ii) requirement that manufacture of the locomotives be substantially completed prior to the applicability date of the standards for which the manufacturer seeks relief prevents the hardship provisions from being applicable in such cases, and effectively makes them useless to manufacturers.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

The purpose of this exemption is to provide relief to manufacturers in those cases in which they have a significant investment into a locomotive that cannot be completed in time to comply with the regulations. However, we believe that EMD is misinterpreting the term "substantially completed prior to the applicability date of the standards". They seem to be reading the phrase "substantially completed" to mean more complete than we actually intended. We do not mean that a locomotive needs to be 90 percent complete or even 50 percent complete. Rather we mean that a locomotive would need to be assembled to a degree that it represented a substantial investment by the manufacturer toward meeting the standard on time. In general, we would likely consider locomotives "on the production line" at the time of the delay to be eligible for relief. It is also important to note that even without hardship relief, manufacturers can introduce into commerce locomotives meeting the previous Tier of standards by using averaging, banking, and trading (ABT) credits. Thus we are not modifying the proposed regulatory language.

4.1.7.2 Reporting to EPA the Number of Locomotives Exempted Annually

What Commenters Said:

EMD commented that §1033.250(a)(2) sets a requirement that manufacturers report to EPA the number of locomotives exempted each year. The commenter stated that it believes EPA should make clear that this reporting requirement extends only to locomotives included under manufacturer-owned, testing, display, etc. exemptions, and not to those exempted in accordance with the provisions of §1068.230 because they were exported.

Letters:

Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We agree with this comment and are revising the regulations to exclude exported locomotives from the reporting requirement.

4.1.7.3 Small Railroads

What Commenters Said:

GE commented that it believes EPA should revise certain elements of the small business provisions. The commenter requested that EPA clarify that the original equipment manufacturer (OEM) is not responsible for determining whether a railroad qualifies as a "small railroad" under the regulations.

Letters:
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We believe the best way to ensure that certificate holders exercise due diligence in the application of their certificates is for them to be potentially liable for their misapplication. Thus, we will not categorically absolve the certificate holder in the regulations. Nevertheless, we do believe it is important to state here that we would not expect to apply penalties to the certificate holder for misapplication by a non-small railroad where we believed the certificate holder did exercise due diligence. We are also adding to §1033.610 a note that certificate holders may require written confirmation from the owner/operator and that such written confirmation to a certificate holder is deemed to also be a submission to EPA. In the absence of other information indicating that the certificate holder should have known otherwise, we would consider obtaining such written confirmation to qualify as due diligence.

4.1.7.4 National Security

What Commenters Said:

The Department of Defense (DoD) Clean Air Act Services Steering Committee (CAA SSC) recommended that EPA remove §1042.601(b), and add a new section that uses the same national security exemption language contained in 40 CFR 94. The commenter stated that it believes that, as drafted, the language will not extend the national security exemption to qualified marine compression-ignition engines covered by the proposed rule, and will also lead to confusion amongst the regulated community and the regulators charged with enforcing the regulation. The commenter stated that it believes the clearest way to provide for a national

security exemption is to use the same language in §94.908 and to state the language directly in Part 1042. The commenter recommended that EPA remove §1042.601(b), and copy the national security exemption language §94.908 directly in the new Part 1042, Subpart G - Special Compliance Provisions.

Letters:
Department of Defense CAA Services Steering Committee OAR-2003-0190-0568.1

Our Response:

While we do not necessarily agree with the comment, we see no harm in specifying the national security exemption for marine engines in a single regulation section. Thus the final regulations do so.

4.1.7.5 Approval of Testing Exemptions

What Commenters Said:

EMD commented that the Part 1068 requirement that manufacturers obtain an exemption from EPA prior to testing locomotives in revenue service is a carryover from the Part 92 regulations, and stated that the process under Part 92 has not worked well. The commenter noted that disposition of exemption requests came quickly initially, but after the retirement of the person who was handled them, the dispositions slowed down markedly, or have not come at all. The commenter stated that it believes that the staff at the Certification and Innovative Strategies Division is insufficient to handle the volume of requests. The commenter further stated that the situation of slow or no dispositions is intolerable for a company that needs to run field tests of new technology in order to make design progress, but does not want to be in violation of EPA rules. To remedy this situation, the commenter suggested that testing exemptions should be granted to manufacturers without the necessity for waiting for an approval, with the following requirements: manufacturers must submit to EPA the information required by §1068.210(d), at least 30 calendar days prior to commencement of the test (the commenter stated that submission via e-mail, with hard copy via regular mail, would be acceptable due to the irradiation requirements for mail addressed to the ZIP code of EPA Washington offices); EPA would have 30 calendar days from the date of the e-mail submission to request modification to (or to deny) the exemption, and no response or denial by EPA within that period would constitute approval of the exemption; and, the manufacturer must comply with the requirements of §1068.210(e). EMD included a similar comment about our approval processes in general.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662

Our Response:

We agree with the EMD that it is important to process requests for testing exemptions

quickly to facilitate the development of new technologies. We commit to evaluate our review practices to eliminate any unnecessary delays for testing exemptions and other approvals.

4.1.8 In-Use Standard Adjustments

What Commenters Said:

Caterpillar, Inc. and EMA commented that they support the use of in-use adjustments for locomotives. The commenters stated that they believe that the magnitude of the NOx in-use adjustments are probably adequate for locomotive applications (§1033.250, Table 1); however, they believe that the particulate adjustments are not adequate and do not reflect the uncertainty of particulate filter technology. The commenters also stated that the likelihood of inadequate control of particulates for several years as experience is gained is much greater than for NOx aftertreatment. The commenters suggested that the in-use adjustment for particulate matter (PM) should be increased to at least 0.03 g/bhp-hr for locomotives that the in-use adjustments for both marine and locomotives should extend for at least four model years past the introduction date of the new standards to allow the identification of problems, development of solutions to the problems, and allow for the possibility that initial corrections may not be completely adequate. The commenter stated that the in-use adjustment increment for the fourth model year could be reduced by some percentage to account for the expectation of a substantial improvement if not a complete solution. Lastly, the commenter suggested that any in-use adjustments for PM should be extended to Tier 3 due to the substantial PM reduction proposed in the rules. EMA further commented that t it believes that the in-use adjustments should apply to the base cycle standards, which would be the basis for the not-to-exceed (NTE) levels after applying the appropriate factors.

EMD noted that §1033.150(f) provides an adjustment to be applied to the NOx standards and family emissions limits (FELs) of freshly manufactured 2017 through 2019 line-haul locomotives for determining compliance with standards during in-use testing. The commenter stated that it appreciates this flexibility but believes that it should also be applied to model year 2015 and 2016 Tier 4 line-haul locomotives fitted with NOx aftertreatment at remanufacture. The commenter further stated that this is in accordance with the provisions of footnote c of Table 1 of §1033.101, as the aftertreatment technology fitted to such remanufactured locomotives is likely to be similar to that applied to freshly manufactured 2017 through 2019 model year locomotives.

GE commented that it supports extending the number of model years over which an in-use NOx add-on would apply while at the same time lowering the in-use add-on significantly. Specifically, GE supported an in-use add-on of 0.6 g/bhp-hr to apply until model year 2023. The commenter believes such an approach provides a more appropriate compliance path for what will be very challenging Tier 4 technology implementation.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0591.1

Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
General Electric (Supplemental Comment)[1]

Our Response:

We believe it would be appropriate to provide alternative sets of margins available to manufacturers willing to accept more stringent in-use compliance levels for NOx in exchange for somewhat less stringent levels for PM, and that it would be appropriate to apply these margins to marine engines. We also believe it would be appropriate to provide alternative sets of margins available to manufacturers willing to accept more stringent in-use compliance levels for NOx in exchange for the NOx adjustments applying to additional model years. Thus we are revising §§1033.150 and 1042.145 to make these changes.

With respect to the model years for which these adjustments should apply, we agree that they should be available for Tier 4 engines that meet the standards early. However, we do not agree that they should be available for engines produced more than three years after the Tier 4 standards begin to apply.

With respect to how the adjustments will apply for the marine NTE standards. The final regulations specify that they are to be added to the NTE standards that are calculated from the duty cycle standards. Manufacturers may not calculate NTE from the adjusted duty cycle standards. This approach is consistent with the regulations in 40 CFR part 1039.

4.1.9 Non-SCR Diagnostics

What Commenters Said:

AAR noted that the NPRM contains general requirements for diagnostic systems, requires diagnostic systems for selective catalytic reduction (SCR) systems, and requests comment on whether Tier 4 locomotives should be equipped with diagnostic systems. The commenter questioned why diagnostic systems would be required at all; noting that, insofar as compliance with EPA standards is concerned, only locomotives are subject to in-use testing. Thus, the commenter stated, there already is a mechanism in place for determining whether locomotives are operating properly from an emissions perspective. AAR commented that it believes that it is counterproductive for EPA to impose requirements for diagnostic systems that only apply if a manufacturer chooses to include diagnostic systems. The commenter stated that such requirements provide a disincentive to manufacturers to include diagnostic systems, and the disincentive is particularly strong for diagnostic systems based on new technology.

AAR also commented that it believes that it is vitally important that EPA not require

1 Email from Shannon Broome, General Electric, to Byron Bunker, U.S. EPA, Re: Supplemental Comment of General Electric - February 12, 2008

railroads to take locomotives out of service because of a diagnostic system malfunction. The commenter suggested that EPA require the repair of any mandated diagnostic system the next time the locomotive is at a shop capable of performing the repairs or during the next periodic inspection. Regarding the proposal to require malfunction indicator lights, AAR commented that it is concerned that given the transient conditions that occur during the operation of locomotive engines, malfunction indicator lights might briefly turn on during transient conditions even though there has been no malfunction. The commenter stated that it is concerned that the proposed provision to require that malfunction indicator lights to remain on for twenty-four hours, unless the engine is serviced, could result in lights going on with such frequency that engineers will ignore them and they will not serve a useful function. AAR suggested that EPA only regulate mandated diagnostic systems and address the repair of mandated diagnostic systems through the following new subsection: "Defective diagnostic systems must be repaired the next time the locomotive is in a repair shop equipped to make repairs or at the time of the next periodic inspection required by 49 C.F.R. §229.23, whichever occurs first."

The New York State Department of Environmental Conservation commented that it believes that that engine diagnostics programs would be equally valuable for Tier 4 marine engines. The commenter noted that modern marine engines have electronic controls to monitor and control engine operation, and further stated that these electronic controls can be quickly developed into an emissions diagnostic system for the marine engine. The commenter suggested that this diagnostic system and repair log could be reviewed during a vessel's safety inspection. The commenter noted that timely identification of defects in emissions control systems, and prompt, effective, repair of those defects is essential to ensure that the potential emissions reductions of a regulatory program are realized; thus the commenter urged EPA to require emissions control diagnostic systems that will identify emission control system defects. The commenter stated that if such remote maintenance diagnostic systems already exist in the railroad industry, extending such systems to monitor emissions control system components should not pose an insurmountable burden to the industry. The New York State Department of Environmental Conservation commented that once a defect is identified, it is necessary for the owner/operator to take action to correct the defect. Thus the commenter urged EPA to implement an Inspection and Maintenance (I&M) program, where locomotive emissions diagnostics are periodically checked, and the results of the inspection and any necessary repairs documented.

GE commented that it believes the technology for on-board diagnostics (OBD) is not sufficiently reliable to impose as a regulatory requirement and the proposal creates disincentives to their introduction. The commenter further stated that it believes that the in-use and production line test programs are sufficient to assure compliance.

GE commented that it believes the rule would need to be revised, at a minimum, to allow the alarm to be recorded, silenced, and addressed at the next regular service interval. However, the commenter stated, EPA should recognize that: (1) it has an effective in-use testing program, and (2) the rule's recall provisions provide tremendous incentives for manufacturers and remanufacturers to design and build locomotives and kits carefully to achieve the standards reliably. GE urged EPA to reconsider its position and not convert OBD into regulatory

requirements simply because they are installed on the locomotive. The commenter suggested that EPA instead allow the products to develop and be tried and tested - if they function well, the market will force their use and EPA will not need to create a regulatory program around them.

With regard to OBD for Tier 4 locomotive and marine engines, EMA commented that it agrees with EPA that such a program, if justified, should be focused on monitor functionality and not actual emission levels or thresholds. The commenter also stated that it agrees with EPA that it would be more appropriate to address this issue in a future rulemaking in the broader context of all nonroad diesel engines (and suggested that EPA defer this to a future rulemaking). The commenter believes that, given the broad range of considerations necessary for OBD requirements, attempting to include OBD in the current rulemaking could significantly delay finalization of this rulemaking and possibly could delay the targeted implementation dates.

Regarding the request for comment on whether or not manufacturers should be required to demonstrate that the diagnostic system is capable of verifying proper function of emissions controls, EMD stated that it believes that this has already been address in other provisions of the proposed rule. The commenter noted that there is a proposed requirement that engines equipped with SCR systems have diagnostic systems which detect inadequate reductant supply or quality and illuminate a malfunction indicator light. The commenter also noted that there are in-use testing requirements (Part 1033, Subpart E), which it believes serve as a powerful incentive to manufacturers to assure that their locomotives do meet emissions standards throughout their useful lives, regardless of the circumstances of the production line test. The commenter noted that these in-use tests will be run with the in-use catalyst; and further that failure of an in-use test casts the emissions performance of not only the tested family, but also on all locomotives of similar design, into doubt. The commenter stated that it believes that the in-use testing requirements are so powerful that the value added by a comprehensive diagnostic system is questionable. The commenter noted that it is not aware of another no urea or other reductant quality sensor that would be sufficiently durable for locomotive application that could not be fooled by a carefully chosen, less expensive material. EMD urged EPA to be wary of introducing stringent diagnostic requirements.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
General Electric Transportation (GE)OAR-2003-0190-0590.1
New York State Department of Environmental Conservation, Office of Air Resources OAR-2003-0190-0583.1

Our Response:

We agree with the commenters that stated that a mandatory emission diagnostic requirement is not necessary for locomotives. We also agree that a mandatory emission diagnostic requirement for marine engines would be better addressed in a broader context.

We disagree with New York's comment that we should implement a new inspection and maintenance program for locomotives. Locomotive operators are already subject to the most stringent maintenance requirements of any mobile source category. Thus no new program is needed.

Finally, in response to these comments, we are revising the regulations in §1033.110 to ensure that they do not create a disincentive to install diagnostic systems on locomotives. As noted in section 4.2.8, we are also clarifying in §1033.815 when repairs need to be made.

4.1.10 Refurbished Locomotives

What Commenters Said:

MotivePower, Inc. requested that EPA raise the proration factor for a refurbished switcher locomotive from 0.6 for a 20-year-old locomotive to 0.8 for a 10-year-old locomotive (§1033.705). The commenter noted that refurbished locomotives include multi-engine switcher locomotives that are built on the platform of an older locomotive, and typically only the frame and below-deck components are maintained in the multi-engine conversion process. The commenter noted that these parts have an indefinite lifetime and, for this reason, a locomotive converted to a multi-engine locomotive has durability equivalent to that of a new locomotive. MotivePower also noted that, given the technology-forcing nature of the proposed remanufacture standards, the lifetime of a locomotive will depend more and more on its ability to meet more and more stringent emission standards. In this context, the multi-engine locomotive's lifetime could outreach almost any single engine locomotive, since small-engine emissions control technologies are more available and cost-effective than large-engine emissions control solutions. The commenter stated that increasing the proration factor for a multi-engine locomotive increases its credit producing value and could allow manufacturers to price multi-engine locomotives more competitively. Lastly, MotivePower commented that competitive pricing would result in broader market penetration and faster turnover of an aging switcher fleet to the ultra-clean multiengine locomotive and would thereby generate significantly greater health benefits for communities located near rail yards.

With regard to the incorporation of emission standards and credits for refurbished locomotives (i.e., those that contain less than 50 percent but more than 25 percent, by value, previously used parts) as part of this rulemaking, the Northeast States for Coordinated Air Use Management (NESCAUM) commented that it would support a program that encourages refurbishing older locomotives that would otherwise continue to operate essentially with no emissions improvements.

EMD commented that in §1033.640, EPA has taken the a simple provision in Part 92 for determining whether a locomotive with some new and some previously used parts has to meet freshly manufactured locomotive or remanufactured locomotive standards, and made it more complex without answering the recurrent question of the Part 92 provision—how to value the previously used parts. The commenter recommended that EPA revert to the simple, easy-to-

understand Part 92 provision, and adopt the valuation method pioneered by the Federal Railroad Administration in the recently released crashworthiness rule, at 49 CFR 229.5. The commenter stated that with the statement that "A single existing locomotive cannot be divided into parts and combined with new parts to create more than one remanufactured locomotive" (§1033.640), EPA should be aware that it is commonplace in the railroad industry for parts from locomotives being rebuilt to lose their identities once the locomotives are stripped, and parts from one locomotive may well wind up on another locomotive. The commenter noted that it is rare for more locomotives to emerge from a rebuilding process than went in, because new underframes are not manufactured. The commenter suggested that EPA not word provisions such as this to allow interpretation to disallow traditional, and emissions-neutral, practices in the railroad industry. EMD commented that, regarding §1033.640(d)(1), EPA stated that "A locomotive with a used frame but all other parts new is a freshly manufactured locomotive because the frame value is less than 25 per cent of the total locomotive value." The commenter stated that EPA has really no way of knowing this in all cases, and recommended that this example be dropped from the rule. The commenter suggested that EPA simply allow the 25 per cent number to stand by itself, with adoption of the Federal Railroad Administration (FRA) method of calculating it.

The Texas Commission on Environmental Quality (TCEQ) commented that it believes that the emission standards for refurbished locomotives should be consistent with those applicable to remanufactured locomotives since the only real difference between these classifications is the amount of previously used engine components being exchanged. The commenter stated that it supports establishing emission standards that would require both refurbished and remanufactured locomotives to meet the highest tier of emission standards applicable to new line-haul or switch locomotives as appropriate at the time of the locomotive's refurbishment.

Environmental Defense, NRDC, et al. commented that they strongly share EPA's concern about locomotives that are refurbished, pollute at high levels, and elude protective emission standards. The commenters stated that they believe Congress intended to adopt a functional test to apply protective emission standards to new locomotives and new engines used in locomotives that are 'new' in the natural and ordinary meaning of that term. Conversely, the commenters noted, if locomotives or engines are functionally refurbished and not subject to protective emission standards, the core statutory protections and purposes of CAA Section 213 would be circumvented. The commenters further stated that EPA's leadership in applying protective emission standards to refurbished locomotives is critical in effectuating the statutory text and purposes of section 213 by securing vital protections for human health and the environment impacted by refurbished albeit high-polluting locomotives.

Environmental Defense, NRDC, et al. commented that they believe EPA's proposed definitional test is wide of the mark. The commenters noted that EPA proposed to adopt a rote economic replacement value test in determining whether a locomotive is refurbished. The commenters noted that they have vigorously opposed such applicability tests in other CAA contexts for their utter lack of nexus with the statutory text and purposes. (The commenters cited the rejection of a similar applicability test under the new source review program by the D.C. Circuit, which held that "the sort of ambiguity giving rise to Chevron deference is a

creature not of definitional possibilities, but of statutory context." New York, et al v. EPA, 443 F.3d 880 (D.C. Cir. 2006).) The commenters stated that they supports EPA's general policy direction but oppose its proposed definitional change because of its strong potential to be under-inclusive in addressing significant locomotive refurbishments that are in fact functionally tantamount to a new locomotive.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Environmental Defense, et al. OAR-2003-0190-0592.1
MotivePower, Inc. OAR-2003-0190-0613
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2003-0190-0551.1
Texas Commission on Environmental Quality (TCEQ) OAR-2003-0190-0612.1

Our Response:

We disagree with MotivePower's claim that refurbishing a locomotive (i.e., replacing 50-75 percent of the parts with new parts) would consistently lead to a service life that is as long as a freshly manufactured locomotive. Thus we are finalizing the proration factors as proposed.

While we do not agree with EMD's comments in detail, we do agree that the proposed regulations should be modified to be clearer. For example, we are clarifying that refurbishers may use the calculation methods specified by the FRA.

Finally, while we agree in spirit with the comments of TCEQ, ED, and NRDC, we believe that they need to be balanced against the need to avoid creating disincentives to refurbish older switch locomotives. Should the requirements applicable to refurbished switchers be too onerous, railroads would likely leave their switchers in the original higher-emitting configurations rather than update them to new technology that meets EPA standards. Thus, while the final regulations will subject most refurbished line-haul locomotives to the same standards as freshly manufactured locomotives, refurbished switch locomotives will continue to be subject to less stringent standards than freshly manufactured switch locomotives. As specified in §1033.640, refurbished switch locomotives will continue to be subject to the Tier 0 standards through 2014. After that, they will be subject to the Tier 3 standards. We believe that these standards properly achieve the greatest degree of emission reduction without creating a significant disincentive to refurbish.

4.1.11 Misfueling

What Commenters Said:

GE requested that the regulations be clarified regarding fuel and oil-related tampering and include additional measures to prevent misfueling. The commenter noted the proposed requirement of a label near the refueling inlet to say: "Ultra-Low Sulfur Diesel Fuel Only," and

that EPA stated that misfueling would be considered as tampering under §1068.101(b)(1). GE commented that it is concerned that there is no statement in this regard in Part 1033 with respect to the misfueling of locomotives. The commenter also stated that, although it agrees with the statement in §1068.101(b)(1) that the use of incorrect fuel or engine oil may be "tampering," the language only applies if the fuel or oil renders the control system "inoperative." The commenter suggested that this be revised to state that misfueling is tampering even if the system is not rendered completely inoperative. GE noted the misfueling could partially damage the catalyst in a manner that could reduce its effectiveness over the long term so the standard cannot be met throughout the useful life, even if not rendering the catalyst completely ineffective immediately. The commenter noted that while it assumes that EPA intended the approach GE describes, the regulatory language could be read to require that the fuel completely destroy the catalyst immediately before the misfueling would be considered tampering.

GE commented that, to help address the lack of control currently in the fueling process, it is important for the rules to impose more specific requirements on the fuel suppliers and thus ensure that railroads can better manage fuel use. The commenter noted that the Locomotive Maintenance Officers Association (LMOA) Fuels, Lubricants, and Environmental (FL&E) committee will be setting up a study group by September 2007 that will be chartered to: develop a list of recommended analytical tests; recommend minimum testing frequency; develop standard reporting form for suppliers; request suppliers to provide fuel properties to the railroads the standard form; and recommend the use of a standard database. The commenter recommended that EPA consider the recommendations of this group and improve the protections against misfueling. Lastly, GE suggested that EPA revise §1068.101(b)(1) regarding tampering to clearly state that misfueling constitutes a tampering violation, whether or not the control system is rendered completely inoperative.

Letters:
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We state clearly in §1033.815 that owner/operators are required to use proper fuels, lubricant, and other fluids. Nevertheless, in response to GE's comments, we are adding an additional clarification that this requirement applies without regard to whether misfueling permanently disables the emission controls. Finally, we are willing to work with the LMOA in the future to develop better ways of eliminating misfueling.

4.2 Certification Issues

4.2.1 Certification Fees

What Commenters Said:

EMD submitted comments on certification fees and noted that while the certification fees

rule is not part of this rulemaking, and therefore is not open for comment, it is not unprecedented for EPA to make required changes in unrelated rules as part of a rulemaking.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

EMD correctly noted that this rulemaking does not deal with certification fees. We will, however, consider these comments in a separate rulemaking that does address certification fees.

4.2.2 Maximum Power and Useful Life Requirements

What Commenters Said:

EMD noted that the first paragraph of §1033.140 states that "rated power is used as maximum test power in Subpart F"; the commenter noted that the only mentions of rated power and maximum test power occur in §1033.520(c), which discusses power settings for locomotives with nonstandard notches or no notches. The commenter suggested that the language in §1033.140 specifically mention paragraph §1033.520(c). The commenter also stated that it believes that EPA should understand the difference between rated power and maximum test power on any given test. The commenter noted that maximum power depends upon test conditions (e.g., ambient temperature, barometric pressure, and fuel characteristics) and tolerances in the power measurement and feedback components of the locomotive control system. Lastly, the commenter noted that it is not possible in a locomotive to set the maximum power exactly at rated power.

EMD also commented that EPA's definition of brake power ("the sum of the alternator/generator input power and the mechanical accessory power, excluding any power required to fuel, lubricate, heat, or cool the engine or to operate aftertreatment devices") differs from the brake power definition common in the industry, which generally includes all power absorbed by the locomotive external to the engine, and would include the radiator cooling fans, but not the water or lubricating oil pumps, which are mounted on the engine and are driven by an engine internal gear train. EMD recommended that EPA revert back to the Part 92 definition of brake power.

EMD further commented that it believes that EPA's specification of minimum useful life in terms of megawatt-hours should be clarified and revised. The commenter noted that there are different types of power that are generally mentioned in discussion of locomotive power output and that the megawatt-hour meter that is part of the control system of modern locomotives (and required on certain locomotives by EPA) accumulates service in terms of one of the four power outputs; the commenter stated that it believes that the minimum megawatt-hour useful life of a locomotive configuration should be denominated in the same terms. The commenter stated that the reason for this argument involves certainty in determining where a locomotive is in its useful

life, or whether it has exceeded it.

MotivePower suggested that tractive power be used for the purposes of calculating useful life. The commenter noted that in the rail industry rated power has traditionally been interpreted as tractive power; with current locomotive control technology, it is easier to record and monitor generator output (tractive power) versus engine output (rated brake horsepower). The commenter stated that it does not believe that this change will significantly impact useful life calculated values.

EMA noted that the NPRM proposed emission standards and requirements for marine engines less than 75 kW are based on the nonroad engine standards of Parts 89 and 1039, which will be effective as early as 2009 and were made in consideration of the fact that products are carried over from the nonroad segment to marine applications. Previously, these engines were all regulated under the same language (Part 89 for engines less than 37 kW) and, other than application and slight engine modification, contained the same general engine designs for operation and durability. The commenter noted that the NPRM proposed useful life requirements for these smaller products that are significantly different from the nonroad sector. The commenter stated that it believes that the significant difference between the current useful life requirements and the newly proposed requirements of the NPRM nullifies the durability research for the marine products, and does not allow for a smooth transition of design from the nonroad sector (and will force engine manufacturers to create two entirely different products rather than have a carry-over of clean engines from the nonroad sector). EMA suggested that the NPRM useful life requirements remain intact except for commercial requirements (see OAR-2003-0190, p.74), as there is some deviation that can be accommodated from the nonroad useful life periods to specifically account for marine applications. The commenter further stated that with the effective dates and standards as proposed in the NPRM these suggested requirements would not force separate product lines, nor would it prevent transition of compliant nonroad engines into the marine market.

EMA noted that §1033.101 proposed adopting an alternative useful life option for manufacturers and remanufacturers of locomotives with non-locomotive specific engines; however, the commenter noted, this allowance duplicates language in the current regulations which require that a petition for an alternative useful life must include the full rationale behind the request for a shorter useful life and supporting evidence. The commenter stated that it strongly supports the option for an alternative useful life for non-locomotive specific engines, but recommends that EPA provide specific guidance on this issue. Specifically, the commenter recommended that EPA clarify that it is acceptable to utilize useful life units equal to either equivalent nonroad or marine regulatory useful limits, or expressed in the same terms and equal to the published time-to-overhaul limits stated in the manufacturer's literature for the non-locomotive specific engines.

MTU strongly supports the option for an alternative useful life for these nonlocomotive specific engines, but strongly recommends issuance of a clear and concise guideline on the rationale that must be provided in order to receive approval. The commenter noted that available time-to-overhaul data may not be in the same time unit as stated for the minimum useful life.

Since non-locomotive specific engines are typically certified to either marine or nonroad standards, time-to overhaul data may be expressed in hours or years, not in megawatt hours or miles.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1 and OAR-2003-0190 0502, 0594.1, 0662
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
MotivePower, Inc. OAR-2003-0190-0613
MTU DDC OAR-2003-0190-0573.1

Our Response:

We have revised §1033.140 and the definition of "brake power" to address EMD's comments. We have also revised the regulations to make the useful life requirement for engines under the new regulations the same as the currently applicable values. However, since EMA did not provide any new data for 37-75 kW engines, and there is no other evidence to support their claim that our current values are incorrect, we are not revising the useful life requirements for those engines. With respect to alternate useful lives for non-locomotive-specific engines, we agree to modify §1033.101(g) to be more consistent with the marine requirements. In response to MTU's comment, we believe that rebuild intervals expressed in hours can be converted to equivalent megawatt-hr values using good engineering judgment.

In response to MotivePower's comment, we will allow manufacturers to use tractive power for determining useful life. However, in all cases, the useful life must be based on the power measured by the locomotive's megawatt-hour meter. For example, if the megawatt-hour meter reads and records the electrical work output of the alternator/generator rather than the brake power of the engine, and the power output of the alternator/generator at notch 8 is 4000 horsepower, the minimum useful life would be 30,000 MW-hrs.

4.2.3 General Labeling Issues

What Commenters Said:

Regulatory construct: EMA commented that it strongly recommends that EPA consolidate a common labeling regulation similar to the previously consolidated common testing and compliance provisions into Part 1068. The commenter stated that there is an important need and opportunity for EPA to also eliminate the current obligation to provide information on the label which has limited value or utility, which no longer is relevant, and/or which can be provided by alternative means. EMA commented that it believes a common labeling requirement will: 1) eliminate the current existing confusion of having slightly different labeling requirements for different applications, 2) provide a uniform format, 3) enable manufacturers to more easily fit the needed information on the label in a manner which will provide greater flexibility for them to properly install labels on engines where there is ever more limited

available space, and 4) could avoid the need for multiple part labels. The commenter further stated that this will also reduce costs to manufacturers and improve label clarity to inspectors, consumers, or anyone else needing access to label information.

Regulatory construct: EMD commented that they no longer believe that a common labeling regulation (so that all classes of power could have similar, or identical, labels) would be a large benefit to manufacturers. The commenter further stated that it does not encourage EPA to develop a common labeling regulation. The commenter stated that the major effort associated with labeling comes from the requirement, caused by the inclusion of the engine family name on the label, that the labels have to change every year. The commenter noted that this requirement causes new labels to have to be drawn every year, and parts lists to have to be changed to include the new labels. EMD commented that, as long as labels have to change every year, any common labeling regulation would have little benefit for its company.

Label variations: EMA commented that it is pleased with the inclusion of §1042.135(d) and §1033.135(d) in the NPRM allowing the emission label to include a reference to compliance with other standards. EMA commented that it supports the proposed provisions of §1042.135(f) and §1033.135(e) allowing manufacturers to apply for approval of modified labeling requirements. The commenter believes that this option will provide needed flexibility to manufacturers and help reduce the burden of meeting the new and revised requirements.

One-piece labels: EMA commented that it does not support the requirement that a label must be "attached in one piece so it is not removable without being destroyed or defaced" (§1042.135(b)(1)), as this would require that the label can only consist of one part. The commenter stated that it believes that it could be problematic if EPA retains all of the proposed labeling requirements, which are numerous, for engines greater than 19kW. The commenter noted that there is a limited amount of space on emission labels today, and an even more limited number of suitable locations on the engine where the label can be applied which comply with all of the requirements. The commenter strongly recommended that engine manufacturers have the option to use multi-piece labels if necessary.

One-piece labels: EMD urged EPA to modify the language of §§1033.135(b)(2)(i) and 1033.135(c)(2)(i) to allow labels to be made of more than one piece, provided that all pieces are attached to permanent locomotive parts, without the requirement that they be attached to the same part. The commenter noted that on older locomotives, the original manufacture date (a required item of label information) is on the builder's plate, which is riveted to the underframe on the exterior of the locomotive. The commenter stated that it believes that this location is less than optimal for the locomotive emissions label, because the paint, frequently having deteriorated in service, does not always provide a good surface for adhesion, and because the label is exposed to locomotive washing chemicals there. The commenter believes that a better location is inside the cab, at a position on the cab structure—and further, both the underframe and the cab structure are permanent parts of the locomotive, not subject to removal or change through the locomotive's life. EMD also requested that EPA amend Part 92 (§§ 92.212(b)(2)(iv) and 92.212(c)(2)(iv)) to modify the label attachment requirements to allow multiple-piece labels to be attached to permanent locomotive or engine parts, but not necessarily the same parts.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Regulatory construct: We agree with EMA that some of our labeling requirements across engine programs have common elements and should be consistent. However, there are significant labeling requirements that are unique to each regulatory category we have established, such as: lawn mowers, trucks, and locomotives. As such, we believe these specific labeling requirements should be paired with the certification requirements established in each of the appropriate standard-setting parts. A common set of regulations for establishing consistent labeling requirements would need to include the same category-specific requirements that exist today, which would result in a complicated array of provisions. This may involve repeating regulatory text with similar information for different types of information or setting up a default labeling protocol with numerous variations for specific types of engines. Since most engine manufacturers produce engines in at most two or three different regulatory categories, it is not clear whether or not there would be any benefit to manufacturers by adopting a single labeling regulation due to the alternative complications that would arise from the complicated array of provisions that would make up such a unified regulation.

Instead, we have taken the approach of adopting parallel labeling requirements in each of the standard-setting parts. The plain-language regulations are set up to maintain a very high level of uniformity, both in organization and content. As a result, it should be very easy to look up the labeling requirements that apply for each regulatory category. Variations in label content or requirements are generally limited to those things that we believe are appropriate for each particular category. We would welcome ongoing attention to this issue, both to ensure that emission labels have the appropriate content and that requirements are harmonized across programs as much as possible.

With respect to the requirement for new labels every year, we have consistently (over time and across programs) maintained that engine labels should reflect the model year of the underlying certificate. This allows us to oversee the program and ensure that engines are properly certified. Similarly, annual labels help us to identify engines that are being sold with an inappropriate reliance on an expired certificate. For example, a manufacturer could certify an engine family in a given model year and not renew that certification in the following year. Without the model year information on the label, it would be very difficult to determine that these later engines are in fact not covered by a valid certificate.

Label variations: We are adopting the provisions supported by EMA related to alternate label language. We note too that we are adding a clarification to §§1033.135 and 1042.135 to specify that a statement regarding compliance with other emission standards (such as California or European standards) may be a separate statement, or it may be factored into a single statement for both EPA and other emission standards.

One-piece labels: Emission control information labels contain a unified set of information related to the compliance of a specific engine with certification requirements pertaining to that engine. Allowing manufacturers the discretion to spread information across multiple labels located on different parts of the engine carries certain risks; the information could be difficult to locate or could be divided in a way that makes certain portions of the label content more or less visible. We have allowed multiple labels in the past, and observed these types of problems which have led us to move away from this practice. For example, a problem observed in past enforcement cases involved a two-part label in which the compliance statement was isolated from the other identifying information; such a division would increase the risk of removing that portion of the label and applying it to a noncompliant engine.

We believe all locomotive and marine diesel engines have sufficient space available to accommodate the required information. That said, we do provide for omission of label content in special cases where there is not enough space for it. We already require one-piece labels for almost all regulatory categories, and are moving to make the requirement for one-piece labels as broad as possible. Given our desire to adopt parallel labeling requirements in each of the standard-setting parts, and the flexibilities we will offer for situations when this isn't possible, we are adopting the requirement for one-piece labels also for engines below 19 kW.

We are, however, finalizing a special allowance for Tier 0 locomotives to use multi-part locomotive labels, since the locomotives were originally produced before emission regulations started to apply and already included labels that included some but not all of the required information such as (manufacturer and build date).

4.2.3.1 Labeling—Locomotives

What Commenters Said:

EMA suggested that the new heading proposed in §1033.135(c)(2)(iii)(A) eliminate the word 'Engine,' so that the heading states 'Emission Control Information'. The suggested EMA heading will more accurately represents the information being conveyed by the label. It will also make the label easily identifiable on the engine and it will be consistent with the heading requirement in other applications.

EMA commented that it recommends that the requirement to state an engine's useful life (§1033.135(c)(2)(iii)(E)) be deleted in its entirety, as it provides no value to the consumer and is information which can be more readily found elsewhere.

EMA commented that it believes there is a conflict relating to the engine labeling requirements listed in §1033.135(c)(2)(iii)(F) with respect to standards/FEL for engine remanufacture requirements in cases where the engine and locomotive are certified to different standards.

EMA noted that the information required by proposed §1033.135(c)(2)(iii)(G) is more appropriately found in an alternative source, such as the owner's manual and does not belong on the emission label, so it suggested that this requirement be deleted.

EMA recommended that the requirement proposed in §1033.135(c)(2)(iii)(H) be eliminated, as it does not believe that information on critical operating specifications does not belong on an emission control label. The commenter stated that information of this type can be often be too complex and detailed to be accommodated on an emission label, and this information can be included in the owner/operator's manual (the more logical place for information of this nature).

EMD asked that EPA modify §1033.135(b)(2)(i) (which specifies that locomotive emissions labels may be made up of more than one piece, provided that all pieces are attached to the same locomotive part) to allow labels to attached to different permanent locomotive parts. On older locomotives, the original manufacture date, a required item of label information, is on the builder's plate, which is riveted to the underframe on the exterior of the locomotive. This location is less than optimal for the locomotive emissions label, and a better location would be inside the cab. EMD also asked that EPA this for the engine labels.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

In general we agree with EMA's comments related to the requirements of §1033.135(c)(2)(iii)(G) and (H) and have eliminated these as requirements. However, we disagree with EMA's other locomotive comments.

We disagree with EMA's comment that we should not require the word "Engine" on the engine emission label. We included this requirement in the earlier regulations to ensure that installer do not confuse the emission control label for the engine with the one for the locomotive.

We recognize that it may be appropriate to allow the word to be left off the label for non-locomotive-specific engines used in locomotives. Manufacturers may request our approval to do so under §1033.135.

We continue to believe that it is important for the useful life to be on the label because it has important implications with respect to preemption of state and local regulations. EMA provided no basis for a belief that this requirement is burdensome.

EMA's comment regarding the inclusion of FELs results from a misunderstanding of the regulations. The engine and locomotive cannot be certified to different emission standards, and thus, there can be no conflict.

We agree with EMD that Tier 0 locomotives originally labeled before our regulations applied should be allowed the flexibility EMD requested for locomotive labels, and have revised §1033.135(b)(2)(i). However, we see no reason why this flexibility is needed for labels on newer locomotives or for engine labels.

4.2.3.2 Labeling—Marine Engines

What Commenters Said:

Label heading: EMA commented that it prefers the new heading proposed in §1042.135(c)(1) because it more accurately represents the information being conveyed by the label. The commenter stated that it believes this change makes the label easily identifiable on the engine and it is consistent with the heading requirement in other applications.

Identifying limited applications—label: EMA recommended that the requirement in §1042.135(c)(9)—the requirement of including on labels the application to which an engine family is certified—be eliminated. The commenter stated that it believes this requirement is unnecessary and provides no value. The vessel manufacturer and customer know what type of engine they are purchasing. If EPA is interested in knowing what type of engine is installed in the equipment, it is easy enough to identify by contacting the engine manufacturer.

Identifying limited applications—certification: EMA commented that it believes the provisions of proposed §1042.205(v) add unnecessary confusion and uncertainty as to what the engine manufacturer actually is responsible for. The commenter stated that it believes the engine manufacturer's responsibility should be limited to informing the vessel builder of any limitations regarding engine application by complying with the provisions of §1042.135(c)(9). The commenter noted that it believes requirements of proposed §1042.205(v) are already covered by the labeling requirements of §1042.135(c)(9), and therefore §1042.205(v) should be revised. The commenter suggested that EPA change the wording to only require the manufacturer to explain how incorrect use shall be prevented if the labeling requirements of §1042.135(c)(9) are waived.

Identifying applicable emission standards: EMA commented that it opposed the requirement of proposed §1042.135(c)(4) that manufacturers must 'State the engine's category, displacement (in liters or L/cyl), maximum engine power (in kW), and power density (in kW/L) as needed to determine the emission standards for the engine family.' The commenter noted that engine category and power density information can be readily obtained from the application for certification and/or EPA's Certification Database, as can specific information on engine displacement (if this information is not already embedded in the engine family name). The commenter also stated that maximum engine power can be obtained by use of alternative means, such as a reader, which will confirm if a certified rating has been downloaded into the Engine Control Module (ECM). The commenter noted that ECMs of current electronic engines generally have the capability to store more than one certified rating, allowing the vessel owner/user to switch between certified ratings. EMA further noted that, because different rating

calibrations can and often are downloaded to the ECM, the maximum engine power level shown on the label may not match the rating that is currently active in the ECM. The commenter stated that in those rare cases where there is an enforcement need to determine the maximum engine power level of a specific engine, this can be done by directly querying the ECM or by contacting the engine manufacturer.

Date of manufacture: EMA commented that it strongly objects to the proposed requirement in §1042.135(c)(6) to stamp or engrave the date of manufacture on the engine, if it is not stated on the emission label. EMA recommended that engine manufacturers be given the option to show the date of manufacture on the label, stamp/engrave it on the engine, or maintain a record of the engine manufacture dates (which can be made available by the manufacturer to the Administrator upon request). The commenter stated that it believes that allowing for multiple options is consistent with other applications and provides manufacturers with the flexibility to pick the option that makes the most sense for their business.

Identifying emission control systems: EMA and EMD object to the requirement in §1042.135(c)(8) to identify the emission control system with names and abbreviations consistent with SAE J1930. EMA stated that it does not believe there is any value added in having this information on the label, as the consumer will not necessarily be aware of what the abbreviations mean and/or care, and the requirement is unnecessary. The commenter noted that the emission control system is already identified on the application for certification and can be determined from an alternative source, such as the owner's manual. The commenter also stated that this additional information takes up space on the label and makes it even more difficult to comply with the requirement of having a single label. The commenter further noted that the recommended practice in SAE J1930 is limited to light-duty gasoline and diesel vehicles, and heavy-duty gasoline vehicles—which the commenter believes leads to the conclusion that this requirement is inapplicable for marine CI engines. The commenter noted that the NPRM contains language giving manufacturers the option to include the information required by this provision in the owner's manual if there is inadequate space on the emission label. The commenter stated that it believes this option gives strength to the argument that the information required by §1042.125(c)(8) is not critical information, since it does not absolutely have to be on the emission label.

Useful life: EMA recommended that the requirement at §1042.135(c)(12) to state the engine's useful life be deleted. The commenter noted that in the Omnibus Technical Amendment (70 FR 40420, July 13, 2005), the regulatory requirement to indicate 'useful life' on the emission label was amended to require the useful life be shown on the label only if it differs from the default useful life specified in the regulation. The commenter stated that it appears that EPA is reverting to the pre-Technical Amendment regulatory requirement to show useful life on the emission label. The commenter noted that all regulations, except those for Small SI engines, have a clearly established default value for useful life, so there really is no need to include specific useful-life values on the label. The commenter also noted that in cases where an engine manufacturer has certified an engine family with a shorter or longer useful life than the default value, the information can readily be determined from the application for certification and/or EPA's Certification Database. The commenter further stated that it does not believe that useful

life information will provide any value to the consumer and when a regulatory authority requires this information, it can easily be found in the application for certification or in the US EPA Certification Database.

Fuel sulfur content: With respect to proposed §§1042.135(c)(10) and 1042.135 (e) requiring both the engine and vessel to have a fuel label, EMA recommended that the engine should not have to be labeled with a fuel information label if that information can be found in an alternative source. The commenter stated that the requirement to label both the engine and the vessel with a fuel-specific label is overly burdensome. The commenter also stated that it believes that requiring fuel information to be printed on the emission label is of little value to the consumer, because consumers will not be examining the engine to determine the type of fuel that should be used—the commenter believes that having the label be applied by the vessel manufacturer at the fuel inlet is more practical and accessible to the consumer. The commenter also stated that it does not make sense to impose a requirement on the engine manufacturer to provide a fuel label to the vessel manufacturer. The commenter noted that this requirement could add to the cost of the engine, and is an unreasonable burden. EMA commented that it feels strongly that the obligation to produce and apply the fuel information label required for the fuel inlet (§1042.135(e)) has to be on the vessel manufacturer, not the engine manufacturer. Lastly, the commenter stated that an engine manufacturer cannot ensure that the vessel manufacturer is labeling the vessel in accordance with the regulation and should not be held accountable for the actions of a party over which it has no control.

Fuel specifications: EMA also commented that it strongly recommends that the requirement in §1042.135(c)(11) to identify fuel and lubricant specifications be eliminated. The commenter noted that the NPRM contains language giving manufacturers the option to include the information required by this provision in the owner's manual if there is inadequate space on the emission label. The commenter stated that it believes this option gives strength to the argument that the information required by §1042.125 (c)(11) is not critical information, since it does not absolutely have to be on the emission label.

Duplicate labels: EMA commented that it does not support proposed §1042.135(g) requiring duplicate labels and recommended that this requirement be eliminated. The commenter stated that there are additional costs associated with producing duplicate labels, delivering the labels in a secure manner, and establishing the record-keeping requirements to keep track of the duplicate labels forwarded to vessel manufacturers. The commenter also stated that it believes that this opens the door to the fraudulent use of labels. However, the commenter noted that if this requirement is adopted, it believes that a provision should be added that absolves the engine manufacturer of any liability if duplicate labels are misused.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Identifying limited applications—label: Engine families may include engine models certified using any number of the available duty cycles associated with specific marine applications. As a result, this engine-specific information is not available in the manufacturer's application for certification. We believe it would be inappropriate to be able to make this determination only by requesting the information after the engine has been installed on a vessel. For example, if an engine were installed in a vessel with a fixed-pitch propeller even though its certification was based on operation with a controllable-pitch propeller, we would have no basis for suspecting that the engine was installed improperly. Moreover, even if the engine were installed improperly, we would have no ability to evaluate the validity of a manufacturer's claim that the installation was proper.

A manufacturer could omit the label information related to specific applications by conducting additional tests to be able to market the engine for universal application. The incremental cost of running additional test points to be able to generate emission data for all the applicable duty cycles would not be very great. Manufacturers have rather pointed out that their calibrations are tailored to the specific applications to a degree that would prevent them from making their engines for universal use (either for compliance or performance reasons). If designs are matched to the marine duty cycles to the extent they can comply with emission standards, we believe it is entirely appropriate to identify these limitations directly on the engine.

We believe there is value in being able to identify the intended application of the engine from the label. It is important not only for us, but for vessel manufacturers, rebuilders, second owners and others to be able to readily determine the specific application for which the engine is designed and certified. This ensures that engines will be properly installed, rebuilt, and reinstalled in marine vessels throughout its lifetime.

Identifying limited applications—certification: As described above, we believe it is important for engine labels to identify the specific applications for which an engine is certified. We would want this information in the application for certification even if it is on the engine label. It is unclear why manufacturers would want to omit this information from the application for certification. Describing the range of applications for which the manufacturer is seeking certification adds no confusion or uncertainty. Aside from that, the proposal included a requirement that the manufacturer describe in the application what steps they will take to ensure that engines are installed in vessels consistent with any limitations that result from the method of certification. While it is important for the label to include this information, we believe manufacturers will need to take steps to communicate clearly to vessel manufacturers and others who order engines that certain engines may only be used in specific applications. We are therefore keeping the proposed requirements.

Identifying applicable emission standards: The current requirements in 40 CFR part 94 specify that manufacturers must identify the applicable emission standards (or family emission limits) and the per-cylinder displacement. The approach in this proposal involved identifying the engine characteristics instead of the emission standards. A complicating factor for the Tier 3 and Tier 4 standards is that differentiated emission standards in some cases apply based on maximum

engine power and power density in addition to per-cylinder displacement. It is important that each engine have information on the label allowing us to identify the applicable emission standards. This helps with inspections, such as at importation, to confirm that the engine is appropriately certified. It would also help with in-use confirmatory testing, especially where we would be evaluating compliance with not-to-exceed standards using field-testing procedures. As a result, we are modifying the labeling requirements to allow manufacturers to either identify the applicable emission standards or to note the engine characteristics in sufficient detail to determine which standards apply.

We note that the labeling specifications allow manufacturers to identify a range of values for power, displacement, and power density. This should prevent any conflict or contradiction if an engine changes to a different certified configuration in the field. In fact, this serves as an additional reason why the engine should be labeled to identify the applicable standards (or engine characteristics for making that determination). Owners that change calibrations or make other engine modifications should understand that their ability to modify the engine is constrained by the underlying certification, which is fundamentally defined by the emission standards it is designed to meet. Modifying the engine in any way that would cause it to be outside of a certified configuration, including any limitations on power or other calibration settings, would be considered tampering.

It is true that applications for certification contain information related to the applicable emission standards and engine characteristics. However, the database with this information would consist of ten or more year's worth of information from many manufacturers. There are times when an inspection or other determination would be unduly hampered by the time delay in accessing the information. We are in the process of automating the protocols related to certification. These improvements hold the promise of making this kind of basic information readily available from any device with Internet access. We will continue to monitor labeling requirements as we develop these other tools.

Date of manufacture: Under the Clean Air Act, engine certification is based on annual production schedules (or model years), where a manufacturer produces each engine during a production period such that it is covered by a valid certificate of conformity. Identifying an engine's build date establishes clearly for each engine whether it is covered by a certificate of conformity for any given model year. Properly associating each engine with the appropriate model year is important for identifying applicable emission standards, calculating emission credits (where applicable), tracking emission-related defects, and executing a recall, among other things. We are in the process of adopting regulations that would further clarify the concept of build date, model year, and the effective dates of certificates of conformity in 40 CFR part 1068 for all nonroad engine categories. In the meantime, we believe each engine should be clearly identifiable with a certain model year based on its build date. Having this information recorded on the engine prevents a situation in which a manufacturer could manipulate records as needed to gain a more favorable outcome depending on the reported build date of any particular engine or engines. Our experience has shown that it is very difficult to contest a manufacturer's claimed build date, even when it defies any customary business or manufacturing process. We also find it inappropriate generally to have to depend on manufacturers to provide information

that is necessary to determine whether that manufacturer has committed a violation.

A further practical constraint comes from engine inspections, especially at importation where U.S. Customs and Border Patrol agents have limited time to evaluate large quantities of very diverse products. Inspection of engines often depends on knowing an engine's build date to establish which tier of emission standards apply. As described above, a straightforward inspection of an engine should allow an inspector to determine the applicable standards.

Having the build date on an engine would also provide a valuable piece of information, because the manufacturer makes a commitment in the assembly process by printing a specific date on the engine (generally month and year). This information is necessary for us to be able to evaluate whether an engine was produced before or after the effective date of a certificate of conformity. The printed build date information is unalterable, which is very effective for both compliance assurance (or prevention of noncompliance) and enforcement. For example, manufacturers would be very reticent to put a false date (such as a postdate) on an engine if there was a possibility that someone may inspect that engine shortly after the manufacturer introduces it into commerce and where it would be most evident that the date is in error. Likewise, if the printed date is substantially earlier than the actual production date, it may be possible to inspect associated records to evaluate the validity of the printed date (production records by serial number, build dates of equipment in which the engine is installed, invoices, bills of lading, etc.). Having the ability to demonstrate that an engine was produced after emission standards started to apply is essential both for our benefit to ensure compliance, and for the manufacturer's benefit to prove compliance.

Furthermore, where there is a compliance problem, it may be easier to demonstrate that a false build date is a violation than that the engine exceeds emission standards. By requiring build dates on labels, we are effectively requiring manufacturers to make a statement to the government, where criminal penalties apply if the information is demonstrated to be false.

We are adopting the requirement to print build dates on the label as proposed. This is part of a broader effort to adopt this requirement across engine categories.

Identifying emission control systems: We have experienced several enforcement cases in which an engine was introduced into commerce under a valid certificate, but was assembled without critical emission-related components. Without label information that makes it very easy to identify which emission-related components should be on the engine, an inspector would have little or no ability to evaluate whether an engine was built according to its certified configuration. By requiring label designs to be submitted at certification, we have each manufacturer's commitment to label the engine appropriately such that these inspections can occur with greater efficacy. Putting a mismatched label on the engine or building the engine inconsistent with its certified configuration would be an enforceable violation.

While engine owners generally do not need to know which emission-related components are on the engine, we believe rebuilders and remanufacturers do need to know. In fact, they should be using this information on the label to ensure that the engine is serviced properly and to

ensure the engine is returned to its certified configuration if necessary. For example, identifying aftertreatment components on the label would prevent a high-volume engine rebuilder from inadvertently rebuilding an engine without including those aftertreatment components.

To the extent that SAE J1930 specifies terms and abbreviations that are incomplete or inappropriate for marine diesel engines, we would be ready to approve alternate labeling to ensure that labels appropriately communicate the relevant emission control technology information.

Useful life: It was an oversight in the proposal to require the label to include the useful life in all cases. We have modified the regulation in Part 1042 to align with Part 94, where we require the label to identify the useful life only if it differs from the default value, as noted in the comment. In cases where the useful life is in fact different than the default value, we believe this should be noted on the label, since there would otherwise be no reason to suspect that a different value would apply. Knowing the useful life is valuable for a variety of reasons, including identifying the scope of a potential recall and determining whether confirmatory testing should be performed on an in-use engine.

Fuel sulfur content: The long-term standards we are adopting are premised on the availability and the use of emission control technologies that depend on very low concentrations of sulfur in the fuel, such as catalyzed diesel particulate traps. We believe it is necessary to provide any fuel specification information imperative for proper operation and function of the engine on the emission control information label. This will ensure that vessel manufacturers will be made aware of the correct fueling needs for these engines. This information would also be essential for rebuilders and/or owners that employ swing engines or otherwise repower their vessels. This requirement will ensure that there will be no damage to any emission control technology installed on an engine through the accidental use of an incorrect fuel, such as that which would result if ultra low-sulfur fuel is required and not used.

We do not believe it is an unreasonable burden for engine manufacturers to send labels for vessel manufacturers to install at the fuel inlet. This secondary label is necessary for communicating to owners and operators that each refueling event should involve the appropriate fuel. We have written the final regulation to require engine manufacturers to take steps to ensure that vessel manufacturers apply these labels only if the engine manufacturer chooses to use instructions for the vessel manufacturer instead of sending the labels directly.

Fuel specifications: We agree that manufacturers should be able to rely on the owner's manual to communicate fuel-related specifications and provisions that are not related to fuel sulfur levels. We are not including this as a requirement in the final rule.

Duplicate labels: All EPA programs specify that the emission control information label must be readily visible after the engine is in its final installation. We have started to make a uniform accommodation across programs to address those situations where the vessel or equipment manufacturers are unable to install the engine without concealing the original label. We believe it is a reasonable burden for engine manufacturers to send duplicate labels when

necessary as requested by the vessel or equipment manufacturer. We also believe the provisions in §1068.105 are adequate for preventing the misuse or proliferation of duplicate labels for fraudulent purposes. If engine manufacturers find additional ways to provide duplicate labels with a reduced risk of misuse, they are welcome to pursue that for their own practice and to suggest those as enhancements to the regulation in §1068.105.

4.2.4 Certification by Design

What Commenters Said:

With regard to the request for comment on whether owners/operators should be permitted to remanufacture locomotives to their previously certified configurations without submitting new emissions data (§1033.201(h)), AAR urged EPA to adopt this provision to facilitate competition in the remanufacturing marketplace and thereby help control remanufacturing costs. However, AAR commented that it does not agree with EPA that if such an option is offered, the owner/operator remanufacturer should have all the liabilities and responsibilities of a certificate holder. The commenter stated that it believes that if an owner/operator remanufactures a locomotive under this option and subsequently the locomotive fails to meet the required emissions levels due to a design defect in the certified configuration, then the entity that installed the design, not the owner/operator, should be liable for noncompliance. The commenter further stated that if the problem was with the design of the emissions system and not due to any action taken by the remanufacturer, it believes that holding the remanufacturer responsible would be unfair. (The commenter also noted that, in such an event, EPA would likely be taking action against the entity that installed the design in the first instance since there likely would still be locomotives for which that entity was responsible.) Accordingly, AAR suggested that the language of the last sentence be modified as follows: "You have all of the liabilities and responsibilities of the certificate holder for locomotives you certify under this paragraph, except that if the locomotive fails to meet a certified emissions level during its useful life due to a design defect in the certified configuration, the liability for failure shall lie with the previous certificate holder, not the owner/operator."

With regard to the request for comment on whether an owner/operator should be allowed to recertify an already compliant locomotive upon remanufacture by design, EMD commented that it would support the proposed provision if the owner/operator recertifying the locomotive were able to assume responsibility for its emissions performance and assume the liabilities attaching thereto, but not if the liabilities were to fall on the original certificate holder. The commenter also noted that as parts are replaced and upgraded, it is unclear how an owner/operator would be made aware of such details in sufficient detail to assure that all locomotives are correctly remanufactured, while an OEM remanufacture system certifier can simply include in the remanufacture system all necessary components and software to assure a compliant, up-to-date configuration. EMD commented that if the liability were to fall on the original certificate holder, it believes EPA should require that the same brand-name parts or their replacements be used in the remanufactured locomotive, and not third-party 'equivalent' parts over which the original certificate holder has no control.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We continue to believe that it would be inappropriate to allow a railroad to obtain a certificate by design without accepting the responsibilities of a certificate holder. Therefore, we are finalizing the provision as described in the proposal.

4.2.5 Third-Party Components

What Commenters Said:

EMD commented that it believes that EPA should institute a procedure for approval of parts represented to be equivalent to OEM parts, and hold OEMs harmless from emissions standard exceedances caused by the use of non-OEM parts. The commenter also noted that EPA should be aware that there is an active aftermarket in emissions-critical parts for both locomotive and Category 2 marine engines, in which third-party suppliers sell replacement parts claimed to be equivalent to OEM parts; the commenter urged EPA to exercise control over the quality of parts used as replacements in such engines. The commenter noted that engine owners and operators typically buy OEM parts for the first couple of overhauls after a freshly manufactured engine or locomotive is placed in service, but the use of OEM parts tapers off, and parts used for in-service replacements often are made by third-party suppliers. The commenter noted that the OEM has no control over the quality or emissions performance of parts provided by third parties, and the use of such parts in the emissions-regulated environment exposes the OEM certificate holder to liability (since the OEM may have to perform an in-use test containing emissions-critical parts not of its manufacture and to diagnose the reason for any failure). The commenter noted that Part 92 currently says that EPA will hold the manufacturers and sellers of aftermarket parts liable for any in-use nonconformities attributable to those parts; however, the commenter expressed concern that there is not a parallel provision in the preamble or regulatory language of the new proposed rule. EMD suggested that EPA institute a program of qualification of third-party aftermarket parts in the regulatory language that includes the following elements:

- The program should be voluntary;
- If an engine user accepts in good faith a third-party vendor's assertion that a part is equivalent to an OEM part, and its presence engenders an emissions nonconformity, EPA's recourse should be to the part supplier, not to the user;
- A certificate holder that is called upon to perform an in-use test should have the right to exclude a locomotive or engine that contains parts not listed in the appropriate certification application, or not approved by EPA; and,
- In the case of an emissions test performed by others, a nonconformity of a locomotive or engine containing emissions-critical parts not listed in the certification application or not approved by EPA should not create liability for the certificate holder.

Chromium Corporation also requested the inclusion of the following concepts to prevent aftermarket suppliers from being regulated out-of-business by new proposed emission regulations:

- OEM's should take the primary responsibility for developing new engines and retrofit kits for existing engines that meet emission requirements. The OEMs should be the primary certificate holders.
- Just as aftermarket suppliers in the past have proven and guaranteed the suitability (usually considering performance, life, reliability and cost) of their parts or assemblies to their customers, they should be able to continue to participate in the aftermarket, adding emission requirements to the performance aspect.
- Each part or assembly should be evaluated individually as to the extent that it may affect emission performance of each of the regulated pollutants.
- It may be possible to demonstrate that a part or assembly does not affect emission performance (example: head sealing gasket in a power assembly) or that a part or assembly is physically and functionally identical to the kit part or assembly and is, therefore, equivalent and cannot adversely affect emission performance. These parts or assemblies should, as culmination of a simple request process, receive a Certificate of Part Equivalence from EPA. These aftermarket parts or assemblies can then be substituted into any kit without threat of the primary certificate holder denying responsibility for the remaining kit components.
- If a part or assembly is different than the kit part or assembly, it may be necessary to demonstrate emission performance of the affected regulated pollutants through appropriate, but simplified, cost effective testing.
- Once the test results establish acceptable emission performance (equivalence or better) of the aftermarket part or assembly, and this data is presented to and accepted by EPA as culmination of a simple request process, the part or assembly will receive a Certificate of Part Equivalence, the part or assembly can then be substituted into any certificated kit without threat of the primary certificate holder denying responsibility for the remaining kit components.
- Any failure of emission testing must be evaluated to determine cause and the responsible party shall assume responsibility for remedying the problem.
- OEM and other certificate holder should not be permitted to discourage the substitution of any aftermarket part or assembly as long as with it has a Certificate of Part Equivalence.

Chromium Corporation commented that it has developed several examples of how an aftermarket supplier might demonstrate part equivalence. The commenter encouraged EPA to resolve these issues that are very important to the company, as well as others who rebuild locomotive and marine engines, and have an interest in keeping their costs in control. The commenter also proposed that in addition to incorporating its requests into the rule, EPA should delay implementation of the proposed rule to 2010 to allow the aftermarket time to develop products and get appropriate Certificates of Part Equivalence in order to assure continued participation in the market.

Letters:
Chromium Corporation OAR-2003-0190-0651
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502

Our Response:

In response to these comments, we are adopting a component certification program as described in §1033.645.

In addition, as we stated in Chapter 6 of the Summary and Analysis of Comments document for the 1998 rulemaking:

> Any entity which is "engaged in the manufacturing or assembling" of a remanufactured locomotive is potentially liable for that locomotive's emissions performance. In general, EPA would expect to begin enforcement action against the certificate holder, since it is the entity that has the most control over all aspects of the design, certification and installation of a remanufacture system. However, in cases where the certificate holder is clearly not primarily responsible for a nonconformance, EPA would expect to hold the primarily responsible party liable in any enforcement action. For example, if locomotives were remanufactured under a certificate of conformity and were found to be in nonconformance in-use, EPA would pursue enforcement action against the certificate holder. If the remanufacture system were installed by an entity other than the certificate holder and the nonconformity was determined to be caused by improper installation, EPA would pursue enforcement action against the installer rather than the certificate holder, provided the certificate holder provided adequate system installation instructions with the system. Likewise, if an entity were to remanufacture a locomotive into a configuration not covered by a certificate of conformity, EPA would pursue enforcement action against that entity, rather than a different entity that may have simply supplied components for the remanufacture. Having authority to pursue enforcement action against any entity "engaged in the manufacturing or assembling" of a remanufactured locomotive allows EPA to directly pursue action against the entity most responsible for the problem. EPA would not use this authority to hold an entity liable for actions for which the Agency believes that it clearly has no knowledge of or control over.

We continue to believe this to be the appropriate policy for assigning liability for in-use nonconformity. The regulatory authority for this approach can be found in §1033.1(d). Thus, the component certification program should be seen as something that supplements rather than replaces this approach.

4.2.6 Engine Dressing

What Commenters Said:

EMD commented that many C2 engines are derivatives of rail engines, thus it

enthusiastically supports harmonization of C2 marine engine standards with those for the locomotive engines from which they are derived. The commenter noted that locomotives comprise about 95 percent of the market for engines of this size, with marine engines making up most of the remaining five percent, and it believes there is little economic sense to design engines specifically for such a small market segment. In the spirit of harmonization, EMD urged that EPA remove the provision of §1042.605(f), which requires the submission of data obtained on the appropriate marine engine duty cycles for dressed engines certified under another rule, such as the locomotive rule. The commenter stated that it believes this paragraph removes the benefit of the dressing exemption to locomotive engine manufacturers, as satisfying its requirement would require running a separate test, generally in a different facility, as a locomotive cannot operate at many of the test modes and NTE points of the marine cycles.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502

Our Response:

This allowance is intended as an administrative flexibility to manufacturers. It is not intended to relieve them of their engineering responsibilities. Specifically, if an engine manufacturer is selling a locomotive engine for use in a marine vessel we expect them to know how its engine will perform in the vessel with respect to emissions. Thus, we are not dropping this requirement.

4.2.7 Infrequent Regeneration

What Commenters Said:

EMA commented that it believes that conceptually, the infrequent regeneration adjustment factor determination should be the same in all of the regulations relating to engine emission control systems that experience different emission characteristics during discrete planned events not fully contained within the normal emission testing cycle. The commenter noted that the calculation methodology described in the NPRM is acceptable but incomplete—the commenter believes that there is a significant concern with the determination of the frequency factor (F). The commenter stated that if the certification test cycle can be repeated back-to-back, in succession through a complete cycle of loading the diesel particulate filter (DPF) and regenerating the DPF, the cumulative emissions in terms of g/kw-hr can be calculated; however, if the regeneration strategy employed or the in-use operation characteristics of the engine are not consistent with the repetition of the certification test cycle, the determination of F is not defined. EMA commented that EPA should address this in the final rule.

EMD commented that, when adjusting emission levels to account for infrequently regenerating aftertreatment devices, it believes that applying adjustment factors to measured emission levels may be tricky depending on when the regeneration occurs during an emission

test. The commenter stated that it would seem to make sense to disable regeneration during emissions testing to avoid having to try to apply proportional estimates of the effects on emissions collected during the regeneration period of that specific test. The commenter noted that this would not eliminate the need to measure and determine emissions rates in regeneration and in non-regeneration states for each test mode or test phase so that appropriate adjustment factors can be determined and applied; also required for this calculation is a determination of the frequency of occurrence of regeneration events based on operating data or running replicate tests. EMD recommended that EPA explicitly allow in this section disabling of regeneration on infrequently regenerating devices in order to streamline testing.

GE commented that it believes that the rule should not require upward adjustment of certification results to account for emissions during regeneration. The commenter noted that it was proposed that emission levels during certification and in-use testing be adjusted to account for the infrequent regeneration of aftertreatment devices (§1033.525). The commenter stated that it believes that the proposal for the emission standards, in particular, the Tier 4 PM limit, did not take into account the increased emissions that would occur during regeneration events. GE commented that in its review of the record, EPA did not include data from regeneration events and show that the Tier 4 PM limit can be met or perform any engineering analysis to suggest that this is the case. The commenter stated that EPA must have a basis for the level at which it sets the standard, even where such standards are technology-forcing, thus it believes that no upward adjustment should be required.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

In general, we agree with the EMA comments, and are revising the regulatory text with respect to the determination of the frequency factor (F). With disagree with the comments arguing that we should drop this requirement. Discrete regeneration events can be important because it is possible for exhaust emissions to increase during the regeneration process. We expect that in many cases, the regeneration events would be sufficiently frequent to be included in the measured emissions. Nevertheless, this issue becomes a regulatory concern because it is also conceivable that these emission storage devices could be designed in such a way that a regeneration event would not necessarily occur over the course of a test, and thus be unmeasured by the current test procedure. Since these regeneration events could produce increased emissions during the regeneration process, it will be important to make sure that regeneration is captured as part of the certification testing. Therefore, we are finalizing the proposed provisions, which are essentially the same as already apply for other nonroad diesel engines.

4.2.8 Durability and Maintenance

What Commenters Said:

GE commented that it supports the ability to submit and obtain approval of a deterioration factor plan, but urged inclusion of a response timeframe to ensure certificates are issued in a timely manner. The commenter stated that with the proposal to add a requirement that manufacturers submit a Deterioration Factor (DF) Plan for EPA approval in advance of conducting engine durability testing or in advance of submitting the engine certification application (72 FR 15994), it is important that the manufacturer not be delayed in conducting the necessary tests to complete certification. The commenter suggested that if this provision is adopted, it must be accompanied by a 30-day time limit for EPA approval or rejection (and if a manufacturer does not receive a response from EPA within 30-days from receipt, the DF plan should be deemed approved).

EMA commented that it believes that the DF requirements for marine engines should remain as they currently exist, and that the proposed modifications will likely delay the certification process and potentially add significant and unwarranted costs. EMA noted that under the existing regulations for DFs (40 CFR §94.218(d)(1)), if the Agency takes exception to an element of the process, the Agency is entitled to a complete explanation and, in extreme circumstances, may issue a conditional certificate dependant on the exception being adequately justified or corrected. The commenter stated that this process has been in effect, and has worked, for many years in other regulatory contexts. The commenter further stated that it believes that the requirement of an advance DF approval will impose a significant burden on the Agency in the form of standardized approval criteria, uniform application, and generation of approval documentation. Regarding the proposal to define minimum DF data requirements (§1042.245(c)) and the new language requiring testing "at least three times with evenly spaced intervals of service accumulation", EMA noted that manufacturers typically accumulate service time in one test cell and measure emissions in another for efficient resource utilization and each engine swap from cell-to-cell consumes valuable time and resources. The commenter suggested that emission measurements at two service accumulations should be allowed, and multiple tests at each accumulation point could be performed to ensure statistical significance to minimize downtime and enhance test cell utilization. The commenter also suggested the option that manufacturers be able to 'establish a trend of changing emissions' with multiple evenly spaced intervals if the engine deterioration characteristics warrant this approach. EMA also commented that it believes that the locomotive DF requirements should also remain as they currently exist in accordance with good engineering practices, and raised the same concerns and suggestions as stated for marine engines.

EMA requests that EPA apply the proposed provision in §1042.125(a)(4) for shorter maintenance intervals (which currently applies only to C2 marine engines) C1 engines as well. In addition, EMA requests that such a provision be added for locomotive applications as well.

EMD commented that it believes that EPA should not require minimum maintenance intervals for Category 2 engines (§1042.125); rather, it stated, the setting of those intervals should be left to the market. EMD commented that it presumes this was done to protect engine customers from manufacturers. The commenter stated that it believes this ignores the active

nature of the Category 2 engine market, and the fact that this market is characterized by interaction between engine users and engine manufacturers. The commenter noted that such a market is "capable of efficiently setting optimal maintenance intervals without governmental assistance." The commenter also stated concerns with the notion of setting maintenance intervals for systems that are not yet designed. Lastly, the commenter stated that it believes that EPA's maintenance intervals may conflict with the intervals set by maritime classification societies, which set maintenance requirements by vessel class—which it believes could present an unsolvable problem to vessel owners and operators.

EMD commented that it believes that EPA has correctly noted that multiplicative deterioration factors may not be appropriate in cases where testing variability is greater than locomotive-to-locomotive variability. The commenter noted that while it has little experience with multiplicative deterioration factors, it is aware that manufacturers of nonroad and marine engines have pointed out to EPA on several occasions the difficulties that can be encountered in projecting deterioration to useful life when standards are low and testing variability is encountered. EMD stated that it appreciates the flexibility afforded by EPA in this paragraph.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

While we understand GE's concern, we do not believe that it would be appropriate to include a 30 day time limit for DF approvals. Rather we expect manufacturers to submit their plans under §1033.210 sufficiently early to allow for full review.

In response to EMA's DF comments, we proposed to make the marine DF requirements the same as the requirements for other nonroad engines under Part 1039, except that we added a requirement to obtain preapproval. We continue to believe the preapproval process is appropriate, and it is unclear how starting the approval process earlier could result in delays. We have modified the regulations, however, to allow additional flexibility with respect to the number of test points and the spacing in response to EMA's comment.

With respect to EMD's comments on minimum maintenance intervals, we believe that §1042.125(a)(4), which allows us to approve alternate maintenance intervals, addresses their concern. We are also revising the regulations to apply this provision to Category 1 engines, as well. We are not applying it to locomotives because we do not specify any maintenance intervals for locomotives.

4.2.9 Auxiliary Emission Control Devices (AECDs)

Note that comments related to AECDs for locomotives that operate in Mexico are

summarized in section 4.1.6 above, and comments related to AECDs for SCR systems are summarized in section 4.5.

What Commenters Said:

EMA noted that the requirement of safe operation is an overriding consideration for marine propulsion engine systems, and pertains to all applications. The commenter stated that for the applications covered by the NPRM, EPA's assessment of acceptable AECDs must place particular emphasis and priority on allowances that are tailored to ensure safe engine operation. The commenter stated that it believes that special clarity in the language covering AECDs is therefore needed to help guide EPA staff in evaluating applications for AECDs that stem from considerations of safe and durable engine operations in certain extreme environments. The commenter requested the inclusion of language to guide EPA staff, who may not have expertise in the special requirements of the marine environment, to make the often difficult judgment of the necessity of a particular AECD approach. The commenter also suggested that the language have additional assurances to manufacturers that approaches to address the difficult marine applications will get the proper consideration. The commenter stressed that AECDs that may address extremely rare occurrences must still be given proper weighting for safety concerns.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0545

Our Response:

As noted in section IV.A (15) of the preamble we are continuing our general regulatory requirements related to safety. We agree with EMA's comment that safety is important, but do not believe that additional specific language would be appropriate and may even be problematic. It is more appropriate to rely on the existing approach, which is sufficiently flexible to address these concerns.

4.2.10 Other Certification Issues

4.2.10.1 VERIFY Certification System

What Commenters Said:

EMD commented that it believes that the VERIFY system should be modified to allow inclusion of as many sets of test data as are necessary to show conformity to standards of all engine family members. The commenter noted that §1033.225(b)(3), which specifies information needs for amending locomotive certification applications, may lead to the necessity of submitting more than one set of data to support a certification application; however, the VERIFY system, under which locomotive certification is currently carried out, has room for only one set of test data.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We will modify the VERIFY system as appropriate to accept all required information.

4.2.10.2 Joint Freshly Manufactured and Remanufactured Engine Families

What Commenters Said:

EMD also recommended extending the period during which freshly remanufactured and remanufactured engines can be included in the same family to six years after the onset of a new Tier (rather than the proposed five year period), as the normal overhaul period for line haul locomotives is six to seven years. The commenter noted that it welcomes this flexibility on EPA's part, as it avoids the necessity on the part of the manufacturer to institute a new engine family, with a separate certification activity, to accommodate the relatively few locomotives that require remanufacture due to major engine failure before the normal overhaul period. In its comments, EMD requested that EPA make the following change to Part 92: allowing the inclusion of remanufactured engines in the same family as new engines for the first years of a new Tier of standards, as proposed in §1033.230(f). (The commenter also noted that it has suggested extending the five years proposed to six years; any Part 92 provision should parallel the final Part 1033 provision.)

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We agree and are revising the regulations accordingly.

4.2.10.3 Exhaust Sampling Ports

What Commenters Said:

EMA noted that the current marine engine regulations contain a provision for the installation of an exhaust gas sampling port (§94.7(d)), but stated that the NPRM does not spell out a similar requirement. The commenter noted that current marine engines rated less than 37 kW are regulated under Part 89 and contain no similar requirement; and further that the NPRM

and Part 1042 (new regulatory section covering all marine engines), it is unclear whether the requirement for the installation of an exhaust sampling port will apply. EMA requested that EPA clarify whether this requirement will apply or not.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE) OAR-2003-0190-0590.1

Our Response:

Consistent with the regulations for general nonroad engines in Part 1039, this requirement is now located in §§1042.130 and 1042.205.

4.2.10.4 Reporting CO_2 Emissions

What Commenters Said:

EMA stated that the requirement to report carbon dioxide (CO_2) emissions if measured during certification testing will impose an additional burden on certification testing and should be optional if not measured.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE) OAR-2003-0190-0590.1

Our Response:

It is important to note that this provision does not require the measurement of CO_2, merely the reporting of already measured values. We disagree that merely reporting CO_2 is a significant burden.

4.2.10.5 Effect of Calculation Methods on Engine Family Designations

What Commenters Said:

GE commented that it believes EPA should clarify that §1033.230 allows manufacturers to define engine families consistent with system efficiency and other features that might be present on a locomotive. GE commented that it is important for the final rule to give manufacturers the ability to take credit in duty cycle and certificate calculations for features that reduce emissions, such as throttle/speed management, load control, automatic engine stop/start (AESS), hybrid, and other features. The commenter suggested that EPA clarify that §1033.230

does not prohibit establishing an engine family based on the presence (or lack thereof) of these features.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We agree and are revising the regulations accordingly.

4.2.10.6 Reasonable Cost Limits for Locomotive Phase-In

What Commenters Said:

GE commented (with respect to proposed §1033.150 that the Tier 0 and Tier 1 standards would only apply prior to 2010 if kits are available at a "reasonable cost"—an incremental cost to the railroad due to meeting the new standards (including initial hardware, increased fuel consumption, and increased maintenance costs) during the useful life of the locomotive less than $220,000 and initial incremental hardware costs less than $125,000) it agrees that the early implementation of kits should be promoted in the rule. The commenter also stated that it agrees that kits should only be required to be purchased if they are available at a reasonable cost. However, the commenter believes that EPA's proposed reasonable cost values are too low, and need to be increased to levels that reflect what the kits are likely to cost manufacturers to provide incentives for early introduction. GE noted that the $220,000 life-cycle cost also could not reasonably be expected to cover the increased fuel cost that will be associated with these kits. The commenter stated that one of the kits it expects to introduce will likely involve a 3-4% fuel penalty to achieve compliance with the new standard—which alone could exceed the $220,000 cost based on current fuel prices (assuming that fuel prices remain stable).

GE also asked that EPA clarify in the final rule the year on which the dollars values listed are based, and that EPA clarify that there is an adjustment for inflation each year between introduction and 2010. The commenter stated that its view of the reasonable cost provisions could change depending on whether the $220,000 is based on 1990 dollars, consistent with other programs under the Clean Air Act, or if it is based on 2007 dollars. AAR submitted a supplemental comment recommending a methodology to adjust the values.

EMD commented that the requirement that in 2008 and 2009 a person or entity remanufacturing a locomotive must apply a kit to meet the new Tier 0 and Tier 1 standards if such a kit is available at a "reasonable cost" (and for Tier 2 locomotives in the years 2008 through 2012) is likely to limit the availability of kits and hamper manufacturers' ability to deliver the emissions reductions desired by EPA. The commenter stated that it is impossible to define the reasonable cost of unknown solutions—at this time, it is not known exactly what will

be required to meet the new standards. The commenter further noted that if the cost of the hardware to meet the standards exceeds the proposed reasonable cost, the availability of a kit will be postponed until 2010, or until 2013 for Tier 2 locomotives. The commenter suggested that EPA allow market forces to work, rather than artificially setting reasonable cost.

AAR commented that while it does not object to the concept of accelerating the timing of the new Tier 0/1 standards if certified system is available at a reasonable cost, additional protections need to be built in. AAR commented that it should not be sufficient that a remanufacturer merely alleges that it can offer a certified system at a reasonable cost—the commenter noted that there are a variety of entities that could seek to be remanufacturers and EPA cannot assume that any entity seeking to be a remanufacturer has ensured technical feasibility. The commenter recommended that there be a process by which a railroad or another entity, other than the remanufacturer, can provide EPA with information as to the true cost of a remanufacture system, technical feasibility, and other pertinent information. AAR also suggested that if a remanufacturer files an application for certification under this section, EPA should commit to publishing a notice of the filing in the Federal Register and provide interested parties an opportunity to comment (and only including information that was not confidential). The commenter stated that it believes that a Federal Register process would provide railroads and others with a fair opportunity to comment on whether a proposed system was truly feasible.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502
Engine Manufacturers Association (EMA) OAR-2003-0190-0545
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We agree that the costs should be adjusted for inflation and have revised the regulations in that respect. We have also revised the regulations to clarify that the fuel (and other operating costs) include only those costs incurred during a single useful life period. We believe that these changes address GE's primary concern.

While we have revised the cost limits slightly based on our current cost analysis, we do not agree that these values should be substantially higher. Our intent with this provision was to create an incentive to bring the most cost-effective designs to market first.

We agree with AAR that remanufacture system certifiers need to do more than allege that their systems perform adequately and are being made available at reasonable cost. In order to achieve certification, a system must meet all relevant requirements under Part 1033, including testing according to EPA-specified criteria and methodology. Likewise, the reasonable cost showing must conform to EPA criteria in Part 1033, including changes we have made to the proposed requirements in response to AAR requests for clarification and strengthening. We disagree with the AAR comment that we need a formal process to address potential railroad concerns. However, we are adopting two new provisions that address AAR's concerns. First,

we are requiring applicants seeking early certificates to notify their customers when they submit the application. Second, we are limiting the total number of remanufactured locomotives that could be subject to the new standards in 2008 and 2009. We believe that these provisions will allow the railroads to have significant influence over the process and discourage remanufacturers from certifying unreliable systems. Nevertheless, should the railroads believe that an applicant is attempting to certify an unreliable system, we would not ignore their technical input, even without a formal process.

4.3 Emission Credits and Incentives

In addition to the specific comments discussed here, we also received comments supporting our ABT program in general.

4.3.1 Credits From Part 92 for Locomotives

What Commenters Said:

EMD commented that it does not understand why EPA has stated that PM credits generated under Part 92 may not be used under Part 1033, and it urged EPA to delete this provision and allow the use of Part 92 PM credits under Part 1033 without restriction. The commenter stated that this in an inconsistency with the preamble language which says that only credits generated by Tier 0 and Tier 1 locomotives may not be used, presumably leaving open the possibility of using PM credits generated by Tier 2 locomotives. The commenter stated that it does not understand this because it would otherwise encourage manufacturers to use up any PM credits that they might have banked, rather than saving them for future needs and possibly never using them—using the credits would increase overall PM emissions. The commenter also stated that it believes this measure discourages bringing locomotives under Part 1033 (for example by the early introduction of remanufacture systems meeting the Part 1033 standards), making this measure is contrary to EPA's desire for early and rapid inventory reductions. EMD commented that the justification in the preamble paragraph that PM credits generated by Tier 0 and Tier 1 locomotives are 'windfall credits' is faulty; the commenter noted that Tier 0 and Tier 1 locomotives generate PM credits against a lower maximum value of the standard term to be used in the credit calculation equation (not against the respective standards), and therefore, the matter of windfall credits has already been taken care of in the earlier rule. The commenter noted that PM credits have been the most difficult to generate, precisely because of this provision. Lastly, the commenter stated that credits that have been generated under Part 92 are the property of the certificate holders that generated them, and were generated at a cost; the commenter believes that for EPA to 'demonetize' these credits in this manner constitutes a taking of property, and it believes that the owners should be compensated for this.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We have reconsidered our concern regarding the potential for PM credits generated under Part 92 to be windfall credits. The fact that Tier 0 and Tier 1 credits are calculated relative to our estimate of the average uncontrolled baseline does largely prevent manufacturer from obtaining significant windfall credits. Thus, after reconsideration, we no longer believe it would be appropriate to prohibit the use of Part 92 credits in the new program.

4.3.2 Tier 4 Locomotive Credit Restrictions

What Commenters Said:

Regarding the request for comment on whether credit caps should be lower for Tier 4 locomotives (under the current regulations, certified emissions limits for a locomotive using credits cannot exceed the limits for the previously applicable standard), AAR commented that it would not support such a provision. The commenter stated that it believes that a lower cap would not have a positive effect on emissions, since a credit holder could simply apply the available credits to more locomotives (though the commenter recognized the fact that EPA is proposing that credits could not be applied to more than 50 percent of a manufacturer's annual Tier 4 production). The commenter also stated that the purpose of a credit program is to provide incentives, and that it believes that the more credits are limited, the less useful the credit program becomes.

With regard to the request for comment on whether FEL caps should be set for Tier 4 locomotives lower than the Tier 3 standards, EMD commented that it does not support this. The commenter stated that it believes that doing so would have little functional effect, as emissions from aftertreatment-equipped locomotives are highly likely to be significantly lower than the Tier 3 standards, even if they do not meet the Tier 4 standard. The commenter also stated that credits are likely to be used up rapidly anyway, as they will be increasingly difficult to accrue as the new Tier 0, Tier 1, and Tier 2 standards come into effect; and noted that "a megagram of emissions is still a megagram" regardless of it is used on one locomotive with a high FEL or on several with lower FELs. The commenter noted that it will likely be argued by others that Tier 4 FEL caps should be set low to protect extreme nonattainment areas, but the commenter believes that these arguments miss the fact that the fleet average or usage agreements negotiated by railroads with the air quality authorities in such areas ignore the effect of credit programs and only take into account the stack-out emissions of the locomotives. The commenter thus stated that using high-emitting locomotives in such areas handicaps the railroads because they would have to use fewer locomotives than they would have otherwise, rendering the matter of where FEL's are set emissions-neutral in extreme nonattainment areas subject to such agreements.

Regarding the proposal to carry over the averaging restriction that applied to Tier 2 to the Tier 4 locomotive fleet, such that the number of Tier 4 locomotives that may be certified using credits must be less than 50% of a manufacturer's annual production, GE commented that it believes this structure worked well for Tier 2 and should be continued. However, the commenter

noted that given the significant challenge of achieving the Tier 4 NOx limit, it believes that EPA should allow an initial period during which credits could be used for more than 50% of the fleet to address potential supply chain issues or problems with the urea infrastructure early in the program.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
General Electric Transportation (GE) OAR-2003-0190-0590.1

Our Response:

We continue to believe that the proposed credit restrictions for Tier 4 locomotives are appropriate and are making no changes. This is the approach EMD requested, and is generally consistent with GE's comment. We disagree with GE request to relax these credit restrictions at the start of the Tier 4 program. We believe that the other flexibilities at the start of the program are a more appropriate way to address this concern.

4.3.3 Cross-Cycle Locomotive Credit Exchange

What Commenters Said:

GE commented that it believes that EPA should not allow cross-cycle credits for Tier 3 and Tier 4 units unless it can provide for simplified tracking and assure compliance. The commenter stated that it believes credits generated on switchers should not be allowed to be used on line-haul units or vice versa for Tiers 3 and 4, as it believes that, in the switcher market there is the potential for multiple certificate holders that do not participate in the line-haul market. The commenter raised the concern that this could create a two-OEM/one-user situation that will be very difficult to track and monitor.

MotivePower, Inc. requested that the restriction on cross-cycle credit trading be removed from §1033.740. The commenter stated that it believes that lifting this restriction will create greater economic value for ultra-clean locomotives operating on the switch cycle, such as the multi-engine locomotive, and will encourage a faster turnover of the aging switcher fleet. The commenter noted that switchers are generally at the bottom of the maintenance and replacement schedule (for economic reasons) and the only way to encourage turnover of the switcher fleet is to increase the economic value of new and cleaner technologies, and allowing cross-cycle trading of credits generated on the switch cycle would help to do this. The commenter stated that it believes that concerns that a windfall of line-haul credits could be created by allowing cross-cycle trading are unfounded, the commenter noted that emission credits are a function of the locomotive's rated horsepower and the difference between the standard and the FEL. The commenter further noted that switchers are, by definition, limited to a maximum horsepower of 2300 and will thus generate fewer credits than line-haul locomotives that have higher horsepower. However, the commenter suggested that EPA could limit the useful life of a

switcher locomotive eligible to generate cross-cycle credits to seven years, or 70% of the current useful life in megawatt-hours, to assure a credit windfall is not created by allowing cross-cycle trading.

Letters:
General Electric Transportation (GE)OAR-2003-0190-0590.1
MotivePower, Inc. OAR-2003-0190-0613

Our Response:

There are two different set of issues associated with cross-cycle averaging. The first involves issues associated with allowing credits generated by line-haul locomotives to be used by less clean switch locomotives (and vice versa). In this regard, EPA had some concern about the use of credits generated by line-haul locomotive being used to produce new switch locomotives with emissions above the Tier 3 standards. This is because switch locomotives are often concentrated around urban areas. We proposed to prohibit this, and continue believe that prohibition is appropriate. However, we agree with MotivePower's comment that there is little reason to be concerned about the use of switch credits by line-haul locomotives and are allowing it.

The second set of issues are due to a feature of the Part 92 ABT program, in which credits are segregated based on the cycle over which they are generated but not by how the locomotive is intended to be used (switch, line-haul, passenger, etc.). This feature will continue for Tier 2 and earlier locomotives. Under these regulations, line-haul locomotives can generate credits for use by switch locomotives, and vice versa, because both types of locomotives are subject to the same standards. However, for the Tier 3 and Tier 4 programs, switch and line-haul locomotives are subject to different standards with emissions generally measured only for one test cycle. As described in the preamble, we are finalizing special provisions to make this approach work without double-counting of credits.

4.3.4 Locomotive Credit Transfers

What Commenters Said:

With regard to the request for comment on whether it would be more appropriate to require that credits generated by the production and placing in service of a locomotive (whether freshly manufactured or remanufactured) be transferred to the railroads in some or all cases, EMD, MotivePower, and GE commented that such transfers should be voluntary (as is the case in the existing regulations) rather than mandatory.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
General Electric Transportation (GE)OAR-2003-0190-0590.1
MotivePower, Inc. OAR-2003-0190-0613

Our Response:

We agree and will not mandate such transfers.

4.3.5 Restricting Marine Credits By Category and Application

What Commenters Said:

EMA noted that the proposed ABT provisions at §1042.701(c) would allow the use of credits generated by recreational marine engine families to be used by Category 2 marine engine families, which is currently prohibited under §94.304(k)(3). The commenter stated that §1042.701(c) allows greater flexibility for the use of recreational marine engine emission credits, and it supports this increased flexibility; however, the commenter recommended and requested that the final rule include this same flexibility for Category 1 engine families as well. The commenter noted that Category 1 and Category 2 engines compete in certain of the same power ranges, and believes this additional flexibility provision is necessary to ensure that Category 1 engine families have an equivalent and equitable opportunity to make use of recreational marine engine generated credits. The commenter raised the concern that Category 1 engine families could otherwise be at an unfair regulatory disadvantage when compared with Category 2 engines in similar power ranges. EMA also recommended that the 25% discount be removed from the credit calculations, since the useful life of marine engines is already included in the credit calculation (and thus there is no need to apply a further discount to recreational marine engine emission credits); the commenter recommended the following change to §1042.701(d) to reflect this: "(d) Emission credits generated by recreational or commercial Category 1 engine families may be used for compliance by Category 1 and Category 2 engine families."

Cummins Inc. also noted that the proposal allows credits generated by recreational marine engines to be used by Category 2 commercial engines but not by Category 1 commercial engines. Cummins stated that (as outlined in EMA's written comments) it does support the minor changes to the ABT program that expands the allowed use of these credits to Category 1 commercial engines. The commenter believes that Category 1 and Category 2 engines that compete in the same power ranges should be given an equal opportunity to utilize emission credits, and recommended that EPA adopt the language proposed by EMA.

Letters:
Cummins Inc. OAR-2003-0190-0559.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0545

Our Response:

The allowance to exchange credits between recreational and commercial marine engines was included in the proposed regulations by mistake and is not being finalized. We continue to believe that differences between recreational and commercial engines, especially those related to

useful life and usage patterns, are too great for us to have confidence that we could accurately balance the credits.

4.3.6 Alternate NOx+HC Standards

What Commenters Said:

EMD commented that the alternative Tier 4 NOx+HC standard should be equal to the sum of the NOx and HC standards, not the NOx standard only.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We agree that the alternative Tier 4 NOx+HC standard should be equal to the sum of the NOx and HC standards, but believe the sum must be rounded down to prevent gaming. Thus for locomotives, the alternate standard will be 1.4 g/bhp-hr. For marine it will be 1.9 g/kW-hr.

4.3.7 Changing Locomotive FELs

What Commenters Said:

EMD questioned the requirement that manufacturers and remanufacturers must notify locomotive purchasers that locomotives certified to an FEL different from the applicable standard must comply with that FEL throughout their service lives. The commenter noted that the FELs to which the locomotive is certified are included on the locomotive label, and that EPA requires labels to include the statement, "THIS LOCOMOTIVE MUST COMPLY WITH THESE EMISSION LEVELS EACH TIME THAT IT IS REMANUFACTURED, EXCEPT AS ALLOWED BY 40 CFR 1033.750." The commenter stated that it believes the current label statement is sufficient notification, as the locomotive emissions label is required to stay on the locomotive throughout its service life.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We continue to believe that it is essential that all parties involved in such remanufacturing be fully aware of the requirements associated with changing an FEL for a locomotive. The small burden associated with the required notification is clearly justified by this important policy goal. EMD provided no basis for us to conclude otherwise.

4.3.8 Incentives for Replacing or Refurbishing Old Switch Locomotives

What Commenters Said:

AAR commented that it supports the concept of providing credits for replacing old switch engines with low-emitting switch engines, as it believes that government incentives to place low-emitting switchers in service are in the public interest. The commenter noted that the proposed provision was in the preamble, but not the regulations; the commenter urged that EPA include this provision in the final rule regulations. The commenter noted that most of the switch locomotives in the Class I railroads' locomotive fleets are among the oldest locomotives operated by Class I railroads and are generally used for many decades. The commenter further noted that turnover of these locomotives is very slow. The commenter also stated that, even though industry has developed the gen-set and hybrid switchers, the small number of these locomotives that have been placed in service often have been purchased with government assistance. Lastly, the commenter noted that it believes that EPA is rightly concerned that without government incentives, innovative switch engines will remain a small portion of the switch locomotive fleet.

Railpower Hybrid Technologies commented that it believes EPA can also help to expedite the introduction of these ultra-clean locomotives by creating even more incentive for the railroads to do so prior to the proposed implementation dates. The commenter suggested that EPA allow railroads to take full advantage of banking ABT credits when purchasing a unit that is remanufactured in a manner such as theirs. The commenter stated that it believes that changing the ABT factor so to not discount the amount of earned credits when purchasing a remanufactured ultra-clean locomotive will help this occur. Railpower further commented that it believes that if the railroads are given additional incentive to purchase an ultra-clean technology over the alternative of continuing to rebuild and use older, dirtier locomotives and it still make good overall business sense for their company, then they can justify more and earlier introduction of the ultra-clean technologies like theirs.

California Air Resources Board (CARB) commented that it believes there will be a growing trend to provide financial incentives from federal and state agencies (e.g., California's Carl Moyer Program and Texas' Emission Reduction Program) to replace older (40 years on average in California) switch locomotives with advanced technology switch locomotives that can provide up to 90 percent reduction in both NOx and PM, a 20 to 40 percent savings in diesel fuel consumption, and reductions in greenhouse gases (GHGs). The commenter further stated that the existing Tier 2 or 3 nonroad engines in the gen-set switch locomotives can be upgraded with future cleaner Tier 4 nonroad engines upon remanufacture. The commenter noted that the gen-set switch locomotive has ample space and is more easily adaptable than traditional diesel-electric locomotive engines for retrofitting of aftertreatment devices such as diesel oxidation catalysts (DOC), DPFs, and SCR.

The South Coast Air Quality Management District (SCAQMD) commented that the use of multiple off-road engines in conjunction with DPFs and SCR to achieve or exceed the proposed Tier 4 emission standards is particularly promising because it relies on existing, commercially available engines, and because such multiple engine configurations have been

successfully utilized to create lower emission switch locomotives. The commenter stated that it believes that there is no technical reason why such engines and configuration should not be able to achieve a Tier 4 line-haul locomotive in a timeframe enormously accelerated from EPA's proposed regulation. (The commenter noted that a copy of the presentation from National Rail Equipment Company and Cummins attached to its public comments.) SCAQMD also commented that, as part of California's Carl Moyer Incentives Funding Program, it has received a proposal to retrofit a Tier 0 line-haul locomotive from mechanical injection to electronic injection technology; and further that, if this is proven feasible, there will be a low cost approach to further clean up existing Tier 0 and Tier 1 locomotives.

Letters:

Association of American Railroads (AAR)	OAR-2003-0190-0566.1
California Air Resources Board (ARB)	OAR-2003-0190-0596.1
Railpower Hybrid Technologies Corp.	OAR-2003-0190-0492 (hearing)
South Coast Air Quality Management District	OAR-2003-0190-0558.1

Our Response:

We agree with the general goal of creating incentives for railroads to scrap or refurbish old switch locomotives. However, we are not creating specific incentives. Rather, we have structured our ABT program and our requirements for refurbished locomotives in such a way as to also create an incentive to eliminate old high-emitting locomotives from the fleet. We agree with the general belief of CARB and SCAQMD that with appropriate incentives, it may be possible for many Tier 2 gen-set switchers to be retrofitted with Tier 4 engines or for some freshly manufactured switch locomotives to meet the Tier 4 standards slightly earlier than required, and have structured the program to allow such retrofits and early introductions. However, as noted in Chapter 10, we believe that the standards and schedule being finalized are the most stringent that can be mandated considering cost and other relevant factors.

4.3.9 Incentives for Replacing Old Marine Engines

What Commenters Said:

Kirby Corporation requested that EPA consider additional measures to provide incentives or tax credits to encourage vessel owners to replace older engines with cleaner-burning replacements. The commenter stated that it believes such a program would have great value in encouraging the replacement of older engines and encouraging faster stride toward emissions reductions. The commenter also noted the California and Texas programs that have significantly aided in accelerating emission reduction technologies in the marine vessels through the Carl Moyer Program and the Texas Emission Reduction Program. The commenter stated that it believes that programs such as these, or tax credits for capital expenditures on environmental reduction technologies, will greatly aid in achieving a balanced approach for realizing economically feasible emission reductions.

Letters:
Kirby Corporation OAR-2003-0190-0563.1

Our Response:

We agree that replacing old marine engine with new cleaner engines is a valid environmental goal. However, it is not clear how we could do so in the current regulatory construct. Nevertheless, we may reconsider such incentives in another context.

4.3.10 Definitions for Averaging

What Commenters Said:

EMD noted that in both the locomotive and marine parts, there is a sentence in the general definition of "applicable emission standard" saying that the definition "does not apply to [the averaging, banking, and trading subpart] of this part." The commenter stated that it does not understand this, since both ABT subparts use the phrase "applicable emission standard" (§1042.705(a), §1033.705(b)). The commenter stated that it believes that the definition given seems applicable to both of those subparts, and suggested that EPA delete the cited sentence in the definition.

EMD noted that "Actual Emissions Credits" are defined as credits that EPA has verified by reviewing a manufacturer's final ABT report. The commenter questioned whether EPA has a mechanism for carrying out such a review. The commenter noted that it has been submitting ABT reports since calendar year 2002, and has never been notified that its claimed credits have been accepted by EPA. The commenter further stated that, upon asking the EPA certification contact whether EPA intended to respond, EMD was told not to expect a response, but to use the accrued credits as if they were banked. The commenter questioned how a manufacturer is supposed know when credits become "actual."

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

In all subparts other than the ABT subparts the term "applicable emission standard" means either the specified standard if the family does not participate in the ABT program or the FEL if it does. However, in the ABT subpart the term "applicable emission standard" means only the standard. We have revised the regulations to make this clearer.

The distinction between "actual" and "reserved" credits does not normally have a practical significance. However, these two modifiers are used in a strict regulatory sense to emphasize that all credits remain subject to EPA approval until they are reviewed. Manufacturers who choose to rely on reserved credits may not prevent EPA from reviewing the

credits at a later time.

4.3.11 Accounting for Special Locomotive Technologies

What Commenters Said:

GE noted that regardless of the emissions limit EPA promulgates for Tier 4 NOx, it is essential that the certification process allow manufacturers to determine the certified emissions level impact of any technology that reduces emissions. The commenter urged EPA to adopt regulatory provisions that allow for the above technologies to be implemented as well as future technologies. From a process perspective, the approval of these types of technologies in an application would be similar to the approval for AESS systems. The commenter noted that if a manufacturer elects to utilize these provisions and a railroad elects to purchase these features, the information showing the emissions reductions would be included in certification application; and then EPA would review and approve the analysis and testing conducted by the manufacturer as it does with all applications. The commenter suggested language that could be used to implement its recommendation, and urged EPA to include that language (or some similar) in the final rule. The commenter also provided additional detail about such technologies.

AAR noted railroads have every incentive to implement consist management systems that will save fuel and emissions. However, the commenter noted, railroads oppose a mandate to adopt such systems. The commenter stated that it believes that it would be difficult, if not impossible, to quantify the emissions reductions from such systems with the precision required for the purposes of a regulation; further such reporting would be burdensome for the railroads, monitoring compliance would be difficult for EPA, and the railroads could not afford to stop locomotives from operating when such systems failed to function properly. AAR commented that, despite the railroads' concerns over the practicality of quantifying emissions reductions from consist management systems, the railroads do not oppose giving industry the option of demonstrating that EPA emissions standards could be met, in part, by such systems or by any other technology. The commenter stated that it supports including in the regulations a procedure whereby a certifier can demonstrate the emissions reductions from such systems with the precision required for certification and thereby receive the appropriate credit for the demonstrated reductions.

EMD commented that because the emissions reductions possible by consist management are small relative to the total reductions projected by adoption of the new locomotive standards, EPA should not mandate consist management devices that would seek to optimize emissions by operating locomotives at their optimum emissions points. The commenter stated that it believes that EPA should instead include a provision in the final rule that would allow a manufacturer to request approval from EPA for reduction in the emissions values reported on a certification application for locomotives that incorporate such a device, similar to the current provision that allows manufacturers to claim an emissions reduction for locomotives with idle reduction devices. (EMD noted that in this instance, it supports the inclusion of an approval provision, because the nature and performance of consist management devices are likely to vary

considerably.) The commenter also suggested that EPA should leave the fuel consumption reduction possibilities of consist management devices to be driven by the market

Lat-Lon LLC provided comments on its locomotive monitoring system which utilizes wireless communications (GSM/GPRS) and GPS location and speed sensing. The commenter stated that with the installation of this aftermarket system, engine idle times can be determined from primary data including engine run state (run/stop) and speed.

CARB commented that further research and investigation be done to account for technologies such as GE Smartburn (engine adjustments to lower NOx or PM tradeoffs within specific geographical regions), and use of Distributed Power Units (DPUs), Consist Management, and Trip Optimizers can provide emission reductions for specific locomotive operations.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0479, 0510, 0566.1
California Air Resources Board (ARB) AR-2003-0190-0596.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662
General Electric Transportation (GE) OAR-2003-0190-0590.1
Lat-Lon LLC OAR-2003-0190-0481

Our Response:

We agree the regulations need to include provisions to address new technologies that reduce emissions by reducing the amount of work done by the engine (or the amount of fuel consumed) rather than by reducing the brake-specific emissions. These provisions can be found in §1033.530 (g) and (h) of the final regulations.

4.4 Switcher Issues

4.4.1 Switcher Definition and Test Cycle

What Commenters Said:

EMA agreed with the NPRM's proposal to clarify the definition of a switcher locomotive based on total engine power of less than 2300 hp and added that the total locomotive power should include all engines on the locomotive, including those that drive locomotive accessories and may not be directly linked to the traction drive. They commented that this should apply to both the power for switcher definition and the cycle emissions calculations. The current provision of allowing the head-end power unit to be a nonroad certified engine without inclusion in the locomotive cycle emissions should be retained.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We agree that hotel engines should be included in the power for determining whether a locomotive is a switcher. Specifically, we are revising the regulations to include auxiliary engines in the calculation of total power, but only if the engines are permanently installed on the locomotive and can be operated while the main propulsion engine is operating. This means that the power of auxiliary engines that operate only to reduce idling time of the propulsion engine would not be counted.

4.4.2 Use of Certified Nonroad Engines

What Commenters Said:

MTU Detroit Diesel, Inc. (MTU) commented that it is in full support of the proposed provision in §1033.150 to use certified nonroad engines in switcher locomotive applications through model year 2017 to aid in the introduction of clean switcher locomotives; however, the commenter requested that EPA provide clarification regarding this 'streamlined path.' MTU noted that EPA included the proposed provision that engines greater than 750 hp be excluded from this optional certification beginning in 2014 unless the engine is certified to the generator set standards; the commenter suggested that, instead of excluded engines from this power category, EPA should allow nonroad certified engines that are certified to emission levels at least as stringent as the proposed locomotive standards for the same year. The commenter noted that the limitation of "15 in a three-year period" differs from the "30 in a three-year period" that is included in Part 92. MTU commented that it supports the limitation on the number of nonroad engines that may be allowed to be introduced as switcher locomotive engines, after the 10-year streamlined path, but suggested that the limitation should be modified to 30 engines built and introduced over a three-year period.

EMA noted that proposed §1033.150 set forth a provision exempting switcher locomotives from certification, PLT, and in-use testing requirements if a certified nonroad engines is used, but §1033.625 states that up to 15 locomotives are allowed to be produced and sold over a 3-year period with certified nonroad engines. The commenter stated that it believes that these two sections appear to be contradictory to one another. The commenter suggested that EPA clarify in the final rule that §1033.150 allows an unlimited number of certified nonroad engines to be utilized in switcher locomotives as a part of a 'streamlined path' (as discussed in the preamble at 72 FR 15983), for a ten-year window to facilitate and accelerate the introduction of clean switcher locomotives. The commenter agreed that the proposal to allow clean emission technology engines that are nonroad certified into locomotive applications utilizing a 'certification by design' technique will allow a streamlined path to improve emissions, but requested that EPA clarify the term "certification by design" by adding the definition of this term to §1033.901 in the final rule. EMA also commented that it does not agree with the approach of restricting the use of certified nonroad engines in locomotives (§1033.625) to no more than 15 locomotives over a three-year period. The commenter suggested that this restriction be removed

from the regulations, as it is contradictory to the Technical Amendment package of September 2005 that allowed 30 locomotives to be built and delivered with nonroad engines in a three year period.

EMA noted that proposed §1033.150 sets forth three distinct prerequisites in order to allow certified nonroad engines into switcher applications ((i) the engines must be current certified nonroad engines, (ii) less than half of the engine manufacturer's total production volume of the nonroad engines must be going into switch locomotives; and (iii) the engine manufacturer may not generate locomotive emission credits through the 'streamlined path' provision), the commenter stated that it believes that some of these limits/requirements will adversely affect the incentive to implement the 'streamlined path.' The commenter noted that state incentive programs (like Carl Moyer) drive a demand for emission levels lower than the applicable locomotive emission standards. The commenter stated there is thus an emission standards gap between certified nonroad engines and locomotive engines of the same Tier. The commenter stated that it believes that the proposed limit on the generation of emission credits from the use of certified nonroad engines in switch locomotives will, in effect, result in a penalty on the manufacturers of these cleaner engines/locomotives, and may cause a disincentive to utilize the cleaner technology engines.

EMA commented that it is not convinced that the marketplace will be interested in using 'exempt' or 'streamlined' nonroad engines without the benefits of ABT utilization, and EMA recommended that the same FEL or LEV certification be allowed for any certified nonroad product that is used in a 'certified by design' switcher locomotive under §1033.150. The commenter similarly stated that it believes that, as there are no Tier 3 nonroad emission standards for engines above 560 kW and the nonroad Tier 2 standards are lower than the proposed Tier 3 switcher locomotive standards (with the exception of PM), the use of a nonroad Tier 2 certified engine should be allowed for use in a Tier 3 switcher locomotive. The commenter noted that, because of the difference between nonroad and locomotive applications in the timeline for the implementation of each Tier of standards, it will be difficult to implement the 'streamlined path' mentioned in the NPRM. The commenter noted that it was proposed that the locomotive Tier 2 levels would apply between 2005 and 2010 for switcher applications. The commenter stated that, although it is expected that there will be a difference in NOx levels when tested over the nonroad test cycle as compared with the locomotive test cycle, the magnitude of the difference in the standards for NOx between the nonroad (4.77 g/hp-hr (6.4 g/kW-hr)) and locomotive (5.6 g/hp-hr (7.5 g/kW-hr)) engines makes it clear that the utilization of the streamlined path would be advantageous to the environment. However, the commenter stated, manufacturers may not have currently certified nonroad Tier 2 engines to make available to the locomotive marketplace because of the difference in the implementation timelines—the Tier 2 nonroad dates have already passed in some cases.

EMA commented that it believes that it is essential to the rebuild and upgrade of switcher locomotives that legacy nonroad engine products be made available after the next nonroad Tier level standards go into affect, such that railroads may continue to use Tier 1 and Tier 2 nonroad engines in Tier 1 and Tier 2 switcher locomotives. The commenter further stated that it believes that this brings into focus the need for a provision to allow engine manufacturers to build and

sell previously certified nonroad products into the switcher market, and would be difficult to manage with a limit of less than 50% of the production volume going into switcher locomotive applications. The commenter noted that without legacy nonroad engines, small businesses would have to upgrade their legacy switch locomotives to Tier 3 levels if no previously certified nonroad Tier 2 engine were available on the market; and the cost of upgrading to a Tier 3 locomotive may be prohibitive, especially if there are no Tier 3 'kits' available in the market. The commenter stated that it believes this provision should be included in the rule least as a contingency for small railroads. The commenter also noted that the service life of a switcher locomotive can be as long as 40 years (as described by the proration factors in §1033.705 (d)), and thus suggested that the window of availability for the streamlined path extend beyond 10 years for replacement engines that are installed in switchers that were initially certified under the streamlined path.

Cummins Inc commented that it believes EPA should adopt the proposed provisions allowing the expanded use of nonroad certified engines in switcher locomotive applications. The commenter noted that nonroad emission limits are generally more stringent than the locomotive limits, and believes that the proposal provides the needed flexibility to use nonroad certified product while eliminating the financial burden of certifying identical engines to multiple standards.

Letters:
Cummins Inc. OAR-2003-0190-0559.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
MTU Detroit Diesel, Inc. OAR-2003-0190-0573.1

Our Response:

It is important to emphasize that the long-term goal of the regulations is for switch locomotives produced using other nonroad engines to fully comply with all applicable requirements of Part 1033. As is discussed below, we are including an option for certification by design plus a more flexible interim program.

As part of the long term program, we will allow manufacturers to certify by design up to 30 locomotives within a three-year period (instead of the proposed limit of 15). We are adding a definition of "design certify" to §1033.901 of the regulations. That definition clarifies that allowing a manufacturer to design certify only eliminate the need to collect new test data for the locomotive before certification. We believe that it is a legitimate concern that requiring a nonroad engine manufacturer to build and test a prototype locomotive before it can apply for a certificate could delay the introduction of new clean switch locomotives. We further believe that this delay is probably unwarranted where the engine has already been certified under Part 89 or Part 1039 to numerically lower standards. However, we are limiting this to 30 locomotives because once the manufacturer has begun producing these locomotives, it will be able to collect the required data, especially once it begins performing the required production-line testing.

With respect to the interim program, we are adding a clarification that it allows an

unlimited number of switch locomotives to be produced. We have revised the regulations to be clear that such engines are not required to meet the Part 1033 requirements when remanufactured. However, because this regulatory change excludes such remanufactured engines from the definition of new, the special preemption provisions for new locomotives would also not apply for them. While EMA may be correct that prohibiting these engines from generating credits under Part 1033 may be a disincentive to use this option, manufacturers are free to use the locomotive-specific certification option.

EMA's comment that sections 1033.150 and 1033.625 are in conflict appears to be a failure to recognize that they are two independent programs. The comments by EMA and MTU about Tier 3 and Tier 4 engines also appear to result from a misreading of the proposed regulatory text in §1033.150. The only engines for which this option is not available are engines over 750 hp certified to the Tier 4 standards for non-generator set engines after 2014.

4.4.3 Altitude Requirements for Locomotives

What Commenters Said:

EMA noted that proposed §1033.115(e) is a carry forward from 40 CFR 94, requiring engine manufacturers to ensure that engines will comply with emissions standards up to 7,000 feet above sea level; however, the commenter noted, as stated in the preamble the "certifying switch locomotive manufacturer is typically a purchaser of non-road engines and not involved in their design" (72 FR 15972). EMA noted that, beginning with Tier 4, all nonroad engines will be certified for emissions compliance up to 5,500 feet altitude (§1039.101(e)(4)(I)). The commenter noted that there will be few (if any) switcher engines operating above 5,500 feet altitude. The commenter stated that it therefore believes that requiring engine manufacturers to ensure that their nonroad based locomotive switcher engines will meet emissions standards up to 7,000 feet is an unreasonable burden without any reasonable emissions benefits, and requested that §1033.115(g) be changed to reference 5,500 feet maximum altitude above sea level for new switcher engine applications.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We agree that switchers are much less likely to operate between 5,500 and 7,000 feet, and are modifying the regulations to not require switchers to necessarily meet the standards at these altitudes.

4.5 SCR Issues

4.5.1 Urea Monitoring

What Commenters Said:

AAR commented that it does not understand how urea quality would be monitored, regarding the requirement that diagnostic systems for urea-SCR systems monitor urea quality (§§1033.110 and 1033.112). In addition, the commenter suggested that §1033.112 be amended by: deleting "urea quality" in the first sentence and by deleting the second sentence of §1033.112(a); by deleting "or urea quality" from §1033.112(b); and that EPA reconsider its requirements for malfunction indicator lights.

GE commented that while monitoring of urea levels may make sense, it believes the proposal to monitor urea quality is both vague and unnecessary and presumes that urea is the only reductant fluid that might be used. The commenter stated that it agrees that monitoring urea levels is workable; however, the commenter suggested that EPA should not adopt a requirement for monitoring urea quality in the final rule. The commenter stated that the proposal vaguely referred to 'urea quality' without specifying what constitutes acceptable or unacceptable quality, and it does not believe that the rule should mandate quality monitors without an adequate understanding of what can and should be monitored and how that might affect emissions performance. The commenter further noted that EPA projected that a large urea infrastructure will be developed to support the already-promulgated requirements for aftertreatment on trucks; as such, the commenter stated, EPA should impose any requirements regarding urea quality on the fueling infrastructure rather than creating "a vague monitoring provision for the locomotive manufacturers." The commenter also noted that it is possible that over the proposed development timeline for aftertreatment systems that a suitable alternative to urea could be adopted as the reductant fluid in aftertreatment systems. GE also commented that it is not aware of a urea quality sensor that could withstand the locomotive environment and detect the concentration of the urea on a real-time basis. The commenter also stated that it does not believe that EPA's alternative of allowing use of NOx sensors instead of urea quality monitors is workable.

Regarding the request for comment on minimizing the complexity and cost of a diagnostic system and precluding tampering (72 FR 15993), EMA commented that it believes EPA's proposal amounts to in-use compliance requirements on engine manufacturers and is extremely problematic. The commenter noted that the marine industry is highly non-integrated, and engine manufacturers typically are not involved in the design or manufacture of vessel console systems (including malfunction indicator lights (MILs)) or alarms. The commenter also noted that engine manufacturers know of no established methods for detecting 'adequate' urea 'quality' on a real-time basis in-use—the commenter thus believes that the durability of NOx sensors is a key unresolved issue (and the commenter questioned whether an unanticipated NOx reading would be related solely to urea quality in any event). EMA recommended that EPA work with vessel manufacturers - not engine manufacturers - to develop reasonable means to help assure that vessel operators consistently use urea of acceptable quality in those vessels

equipped with SCR systems. The commenter also stated that the in-use regulation of urea utilization in marine vessels is a fundamentally different issue than it is with respect to heavy-duty on-highway (HDOH) vehicles; given the priority that must be placed on the safe and reliable operations of vessels at sea, the commenter stated that it believes that many of the proposed options for ensuring urea usage in on-highway vehicles are out of the question in the marine environment. The commenter also stated that it believes that the U.S. Coast Guard and other classification societies would prohibit the use of any of the proposed HDOH strategies for ensuring urea use in vessels. EMA suggested that EPA consult with marine architects, vessel builders, and the U.S. Coast Guard before finalizing any requirements relating to the assurance of urea use and quality. EMA commented that it has concerns with the proposed diagnostic requirements (§1042.110(a)) on urea use and quality. The commenter stated that any SCR-related diagnostics must be limited to the measurement capabilities of available sensors, and it believes that the requirements of §1042.110(a) will need to be revisited by EPA if such sensors are not developed adequately for the higher-volume on-highway and nonroad applications. The commenter also stated that engine manufacturers object to the requirements of §§1042.110(b) and 1042.115(c) that would provide EPA access to proprietary engine information—the commenter suggested that these paragraphs be deleted.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
General Electric Transportation (GE) OAR-2003-0190-0590.1

Our Response:

The comments summarized here seem to agree in general with our intent regarding the requirement to monitor reductant (urea) level and quality while raising narrower concerns regarding our expectations for how these regulations would work. These regulations are not intended to narrowly prescribe a requirement to precisely measure the quality of urea but rather to require the manufacturer provide a system that would inform the end-user if poor quality urea is inadvertently or purposefully added. Since 2005, Mitsui Corporation has been selling a combination urea level and quality sensor in the Japanese market that can serve this function. In early 2006, Mitsui announced it had created a partnership to distribute its sensor technology to the U.S. market. We are confident in projecting that this direct method of measuring urea quality can be further developed and applied to locomotive and marine applications well before it would be required in 2014 (or later).

In addition to a direct measure of urea quality, our regulations also make clear that we will accept an indirect measure of urea quality based on NOx emission monitoring and rationality logic used to check urea quality. In simplistic terms, if the urea dosing versus NOx control characteristics change immediately after an increase in urea level is observed by a level sensor, it would be reasonable to infer that the added urea was of different quality. If the NOx control characteristics were so poor as to lead to inadequate NOx control (exceeding the NOx standard), the rationality logic would conclude the urea was of inadequate quality. If performance with the NOx standard were maintained, the rationality logic would conclude the

urea was different but of acceptable quality. It is therefore up to the engine manufacturer to determine what it considers to be adequate urea quality with regard to this aspect.

As we have described in our recent nonroad Tier 4 regulations, our recent heavy-duty (HD) onboard diagnostic proposal and in our Final RIA for this rulemaking, we continue to expect that NOx sensor already in production for light-duty passenger vehicles will continue to improve with respect to durability and accuracy such that they will be an appropriate technology solution for U.S. HD trucks in 2010 much less locomotive and marine diesel engines in 2014 and later.

4.5.2 Ammonia

GE requested that EPA clarify the preamble and regulatory statements regarding noxious emissions to clarify that ammonia emissions, a product of the required aftertreatment systems, are not considered noxious. The commenter noted that the NPRM indicated that that the controls that manufacturers use to comply cannot cause noxious emissions (72 FR 15998 and §1033.115(c)). The commenter noted that ammonia causes a pungent odor at a concentration of approximately 5 ppm and eye irritation at 20 ppm. The commenter also noted that for locomotives using aftertreatment, given the size of the engine, it is expected for both transient and steady-state emissions of ammonia to exceed the 5 ppm threshold at which ammonia creates a "pungent" odor. GE further stated that its calculations show that the steady-state ammonia slip with fresh catalyst is 10 ppm and with a deteriorated catalyst can be upwards of 18 ppm, approaching the 20 ppm level at which eye irritation is reported. The higher ammonia concentrations from a locomotive are due to the size of the engine, and due to the level of inlet NOx, there will be a greater amount of urea with corresponding ammonia slip increases. The commenter further noted that the catalyst used to minimize ammonia slip operates by adsorbing the ammonia and storing it; however, when the catalyst reaches a certain temperature, it will release the ammonia it has adsorbed. When the release occurs, it is expected that there will be insufficient NOx present to react with the ammonia to completely convert it to nitrogen, and as a result, the ammonia that is not converted will be released; GE commented that it expects to see transient ammonia concentrations on the order of 50 ppm.

GE stated that it is the company's understanding that EPA: (1) has evaluated these potential impacts[2]; (2) recognizes there will be concentrations that create an odor recognizable to the public; and (3) has concluded that they are acceptable in light of the benefits EPA believes are derived from the Tier 4 NOx standard. The commenter requested that EPA clarify that this issue has been reviewed and that EPA has concluded this level of ammonia emissions, even though causing an odor, would not be considered to "cause or contribute to an unreasonable risk to public health, welfare, or safety while operating" within the meaning of §1033.115.

2 GE footnote 15: EPA staff members have indicated that ammonia cannot be detected up to 17 ppm and have cited that there is a range of potential concentrations under which it can be detected. GE requests that EPA explain in the final rule how its evaluation compares with the 5 ppm threshold established by ATSDR [Agency for Toxic Substances and Disease Registry (Department of Health and Human Services)] as GE has not found literature suggesting that concentrations between 5 ppm and 17 ppm do not cause a pungent odor.

Electro-Motive Diesel, Inc. (EMD) also commented that EPA needs to recognize that emissions of ammonia from NOx aftertreatment systems will be inevitable in engines using selective catalytic reduction to meet the proposed locomotive and marine Tier 4 standards, particularly during transients. Ammonia is a noxious gas toxic in high concentrations, detectable by the human olfactory system at concentrations between five and fifty parts per million. EPA should structure these paragraphs not to disallow emissions of ammonia at technically feasible levels; if EPA fails to do so, manufacturers may be left with no way to meet the Tier 4 standards.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
General Electric Transportation (GE) OAR-2003-0190-0590.1

Our Response:

The issue of NH_3 emissions (or ammonia slip) was raised by several commenters, with claims that excessive NH_3 emissions are "inevitable", and may reach 25 ppm during steady-state operation and 100 ppm during transient operation. We have assessed this issue and concluded that a properly-designed slip catalyst, with good selectivity to nitrogen (N_2), can convert most of the excess NH_3 released from the SCR catalyst into N_2 and water. Recent studies by the Johnson Matthey and the Association for Emissions Control by Catalyst (AECC) have shown that an aged SCR system equipped with a slip catalyst can achieve tailpipe NH_3 levels of less of than 10 ppm when tested on the European Stationary Cycle (ESC) and European Transient Cycle (ETC). The SCR system in the Johnson Matthey study was aged on a cycle which included 400 hours of high-temperature operation at 650 °C (to simulate active DPF regeneration events). Our analysis of the locomotive engine operating conditions presumes a maximum, post-turbine exhaust temperature of 560 °C. This presumption is based on implementation of a "passive" DPF regeneration approach (in which NO_2 created by the oxidation catalyst is sufficient to oxidize trapped soot) and our own testing of locomotives during consist operation in non-ventilated tunnels. Under these conditions, we expect slip catalysts to be durable and effective in reducing NH_3 slip.

Compact urea-SCR systems that have been developed to meet the U.S. 2010 heavy-duty truck standards use closed-loop controls that continuously monitor NO_x reduction performance. Such systems have the capability to control stack emissions of NH_3 to below 5 ppm during transient operation even without the use of an ammonia slip catalyst. We understand that such systems may still emit some very small level of uncontrolled pollutants and we would not generally consider a system that releases de minimis amounts of NH_3 or nitrous oxide (N_2O) while employing technology consistent with limiting these emissions to be in violation of §1033.115 (c) – which is the same way we currently treat passenger cars and heavy-duty trucks with regard to N_2O and H_2S emissions.

It also should be clear that the levels of slip which we believe could be experienced (<25ppm) in the exhaust stack would be rapidly diluted by ambient air at a ratio well in excess of 1,000:1 leading to ammonia levels near a Tier 4 locomotive well below levels detectable through

smell.

4.5.3 AECDs

Regarding AECD allowances for urea SCR systems, EMA noted that the NPRM does provide some instructions regarding defeat devices and allowable AECDs. Those provisions are similar to what is found in EPA's on-highway and nonroad rules for diesel engines. In addition to the AECD allowances found in other rules, the NPRM proposes additional language regarding AECDs for urea SCR systems.

EMA commented that it fully supports the addition of regulatory language regarding AECDs for urea SCR systems, but believes that there are several changes necessary to EPA's proposed language. EMA recommended revisions to §1042.115(f) (Docket Number OAR-2003-0190-0575.1, pp. 78-80 of the comment letter) to better reflect the manner which AECDs may need to be utilized and to create better alignment with the proposed Global Technical Regulation. Specifically, EMA commented that it revised (f)(4)(i)(A)-(B) as it believes that these regulatory paragraphs were too restrictive. The commenter noted that subparagraph (A) limits an AECD to operations outside of the duty-cycle test range of ambient temperature and atmospheric pressure, but commented that this is restrictive as it may be necessary to use an AECD that reduces or stops urea flow while inside those ranges (such as on a light duty-cycle when exhaust temperatures are too low for urea dosing). The commenter stated that it ambient conditions are not always a good indicator of exhaust temperatures. EMA noted that subparagraph (B) limits an AECD to operations at speed/load conditions that are not part of the duty-cycle test, but commented that this is also restrictive as it may be necessary, for example, to use an AECD that reduces or stops urea flow even at speed/load conditions, such as idle, that are considered duty-cycle test points.

EMA also proposed new language for subparagraph (f)(4) that corresponds with the defeat device language found in the proposed Off-cycle Emission Global Technical Regulation. The commenter stated that it believes that this proposed language would allow EPA broader authority to approve, and manufacturers to use, a variety of possible AECDs when necessary to compromise control of one emission to gain an acceptable level of control of another emission; and could also be a reference for the allowance of specific AECDs relating to urea SCR systems. The commenter also recommended that EPA include separate language specific to those systems, similar to what EPA provided in the NPRM, and the commenter proposed a new subparagraph (f)(5) (OAR-2003-0190-0575.1, p.79). The commenter stated that it believes this new language will: 1) allow for the general approval of AECDs in a manner similar to EPA's initial proposal found in subparagraph (f)(4)(ii)(A); 2) allow an AECD where exhaust temperatures are too low to convert urea to ammonia. The language here also is consistent with the NPRM; 3) allow an AECD during the time of urea thawing; and 4) allow an AECD during the time that the SCR exhaust inlet temperature is above the crystallization point of the urea in the injection system, or in the catalyst system itself.

EMA also proposed that its suggested edits to §1042.115(f) be incorporated into the

current on-highway and nonroad regulations as well.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We have met with the commenter on a number of occasions to discuss its comments including its comments with respect to our AECD provisions and the use of urea SCR catalyst technology. Through that process, the commenter has made it clear its first priority is that the Agency have a consistent policy with regard to AECD provisions and urea SCR catalyst technology. More simply put, the commenter would like to have confidence that solutions its member companies develop in order to comply with our on-highway and nonroad regulations would be equally acceptable under these marine regulations. We agree with this sentiment and believe the best way to ensure we can accomplish that goal is to not finalize the proposed AECD revisions, and instead, allow the marine urea SCR compliance path to follow the on-highway and nonroad guidance where appropriate. We believe our current AECD regulations give us broad authority to grant AECDs for elements of system design necessary to limit ammonia emissions or any other characteristics of the system which could have the potential to create an unsafe condition. We fully intended to continue to work with the commenter and its member companies as they develop urea SCR systems to comply with a wide range of our diesel NOx regulations.

4.5.4 Urea Use

What Commenters Said:

The New York State Department of Environmental Conservation noted that engines equipped with SCR technology require a reductant (urea) to work as designed. The commenter stated that since the projected Tier 4 NOx emissions reductions depend on the owner/operator maintaining a supply of the proper reductant necessary for the operation of SCR, an enforceable mechanism is required to ensure that the SCR reductant is in fact supplied. The commenter stated that it believes that the proposed requirements for SCR (low reductant level warnings, tracking/logging of incidents of engine operation without urea, and incident notification requirements) are steps in the right direction, but the commenter urged EPA to take additional steps to ensure SCR operation compliance and enforcement. The commenter suggested the following as part of a periodic emissions I&M program: reviews of SCR reductant usage records, reviews of the computer SCR operating log, and documentation/reporting of incidents of improper SCR operation.

Letters:
New York State Department of Environmental Conservation, Office of Air Resources
OAR-2003-0190-0583.1

Our Response:

The regulations already prohibit operation without urea (or other needed reductants), require automatic data logging, and require operator recordkeeping. Since we may inspect the locomotive or ask for these records at any time, we do not see a need to also include a special I&M program.

4.5.5 Non-Urea Reductants

What Commenters Said:

EMD commented that the proposed regulations contain multiple uses of the words "urea" and "ammonia." The commenter is concerned that these words are used based on an assumption that the Tier 4 NOx standards will be met by urea SCR; however, the commenter stated that much work is being done in the diesel exhaust aftertreatment area, and it is possible that by the time the Tier 4 standards take effect, urea will not be the reductant of choice. The commenter recommended that EPA use more generic language, such as "any necessary reductant" instead of "urea," or "urea or other reductant" (as has already been done in §1042.660).

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1

Our Response:

We agree and have revised our regulations to state "reductant" unless the provision is specific to urea.

4.6 Railroad Requirements

What Commenters Said:

EMD commented that it believes that EPA should make clear, with simple declarative sentences, what the expectations are upon remanufacture of a conforming locomotive; specifically, whether it is sufficient simply to rebuild the locomotive in kind, or if it is necessary to apply a new remanufacture system. The commenter stated that the current provisions that express the requirement that a conforming locomotive engine be recertified with the application of a new remanufacture system and a new engine label when it is remanufactured are scattered throughout the rule. The commenter further noted that there is considerable misunderstanding of the requirement in the industry because of this. The commenter stated that it believes that the provision in the proposed new locomotive rule is an improvement in this respect, but still does not make the requirements sufficiently plain. EMD requested that, since Part 92 will continue to be in effect for some locomotives for some years to come, EPA clarify the remanufacturing requirements for owners and operators.

In its comments, AAR suggested that the in-use testing program for railroads be modified (§1033.810). The commenter noted that, in practice, the in-use testing program has diverted from this original intent because no locomotives have reached the end of their useful lives (many engines are remanufactured prior to the end of their useful life period) and because EPA has sought data from newer locomotives to help in the development of the NPRM. AAR suggested that rather than using whether the locomotives have been operated for their full useful lives or near the end of their useful lives as the sole criterion for testing, the flexibility of the current program could be preserved by permitting the use of other criteria to select locomotives for in-use testing. The commenter stated that it believes this flexibility would permit the railroads and EPA to select a mix of locomotives to be tested that meets EPA's needs. AAR also suggested that EPA cut the number of locomotives to be tested under the in-use testing program in half.

Letters:
Association of American Railroads (AAR) OAR-2003-0190-0566.1
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502 (hearing), 0594.1

Our Response:

We agree in general with both of these comments. We have modified §1033.805 and are adding a similar section to Part 92 (§92.1007). The reader is referred to those sections for the exact language. We have also modified the railroad testing requirements to reduce the testing rate and clarify how the locomotives are to be selected. The reader is referred to §1033.810 for the new language related to railroad testing.

4.7 Test Procedures

4.7.1 Part 1065 Revisions and General Test Procedures

Given the very detailed nature of the comments we received on the proposed 1065 changes, we have addressed them is a separate document.[3]

4.7.2 Locomotive Test Procedures

4.7.2.1 General Locomotive Testing Issues

EMD commented that some of the Part 1065 specifications appear to be aimed at smaller engines. The commenter noted that while EPA recommends using laboratory exhaust tubing that has either a wall thickness of less than 2 mm or is air gap-insulated to minimize temperature differences between the wall and the exhaust, such specifications would not work for locomotive

3 "EPA Response to 1065 Test Procedure Comments Submitted in Response to the NPRM for Locomotives and Marine Engines", Chris Laroo, USEPA, Memorandum to Docket, January 22, 2008, (EPA-HQ-OAR-2003-0190-0846).

stack extensions, which can be as large in cross section as one foot by six feet. EMD recommended that EPA allow the use of thicker material, consistent with good engineering judgment, and of batt insulation around locomotive stack extensions, or around the exhaust stacks of locomotive or of Category 2 marine engines in test cells, to maintain wall temperatures near the exhaust temperature. The commenter also urged EPA not to become too prescriptive with regard to transfer line length or insulation requirements. EMD commented that it is concerned about being able to continue to test the large engines that EMD produces, and note that the large range of engine sizes and applications that is covered by the procedures of Part 1065 dictates that a solution that might work for one engine could be unworkable for another.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

The existing Part 1065 regulations are intended to allow testing for engines of all sizes. As part of this rulemaking, we also carefully reviewed Part 1065 to ensure that it specified procedures appropriate for locomotives and made revisions where necessary. Moreover, Part 1065 includes broad allowances to modify the test procedures if we agree with the manufacturer that such changes are necessary.

With respect to EMD's specific comment about wall thickness, we note that this is merely a recommendation, not a requirement.

4.7.2.2 Engine Testing

What Commenters Said:

Cummins supports EPA's efforts to improve and clarify the testing requirements for individual locomotive engines certified in a test cell and recommends that the 'standard' notch setting for 'nonstandard' locomotive engine applications (table 1033.520(c)) be made applicable to engine families that are used in multiple locomotive applications.

EMA also supports the changes and simplifications provided in the revised locomotive test procedures. The commenter also expressed support for an allowance to test engines to percentage power levels versus specified notches to permit testing to be done in test cells on engines for which the final application is not known.

EMA also noted that EPA has proposed dynamometer testing of a single engine used in a multiple engine locomotive application for certification testing and PLT (see §1033.520(f)). EMA agrees with this proposal. However, the language states that all operating points for the locomotive shall be tested. EMA recommends that the regulatory language specifically exclude engine start-up and shutdown emissions. This exclusionary language also is required to clarify the test methods for multiple engine locomotives.

Letters:
Cummins Inc. OAR-2003-0190-0559.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We have added an interim provision to §1033.150 to further simplify engine cell testing through model year 2013.

We do not agree with comments asking that we add provisions to allow an engine manufacturer to certify engines without knowing the locomotive designs in which they will be used. The standards apply to the actual locomotives and in many cases the performance of the emission controls is very dependent on the locomotive design. However, we are adding a provision to allow manufacturers to "carry across" emission data from one certified locomotive family to a different family if the same engine is used in both families. The manufacturer must then demonstrate to us that the differences in the two families are sufficiently small that the locomotives in the untested family will meet the same applicable notch standards calculated from the test data. Finally, as described above in section 4.4.2, we are also finalizing the proposed allowance to initially certify a switcher family using nonroad engines based on test data collected under parts 89 or 1039.

4.7.2.3 General Locomotive Test Cycle

What Commenters Said:

SCAQMD noted that under the current proposal, transitional emissions and the accumulation of PM emissions in the exhaust stack are not measured by the Federal Test Procedure (FTP), since this procedure does not measure during the transition between test modes. The commenter noted that in locomotive emissions testing that it conducted, significant emissions were found when the locomotive was in a transient state between idle and a higher notch setting and an accumulation of PM in the exhaust system or 'souping' can result in significant PM emissions. The commenter stated that the PM is not emitted immediately, it accumulates until the next time the locomotive goes to a higher power setting and is emitted at that point. SCAQMD commented that since the amount emitted depends on the amount accumulated, it believes it would be more appropriate to attribute it to the idling period rather than the high-power operation when it actually comes out of the stack. The commenter stated that to ensure that the FTP accurately accounts for locomotives, it recommends that emissions during transient modes be considered and the effects of exhaust souping be considered.

CARB noted that EPA requested comments on revised provisions for testing, certification, and compliance. The commenter stated that current EPA test and certification methods are generally adequate for existing locomotives. However, the commenter noted that there are two areas that would benefit from improvement, including accounting for transition and

cold start emissions; CARB staff believes that some adjustments should be made in the existing 40 CFR Part 92 locomotive emission testing to account for transient emissions.

Letters:
California Air Resources Board (CARB) OAR-2003-0190-0596.1
South Coast Air Quality Management District (SCAQMD) (0558.1)

Our Response:

We agree that emissions during notch transitions are potentially important. However, contrary to the comment, the proposed test procedure, which is being finalized, does measure emissions during notch transitions. See §§1033.515 and 1033.520.

We also agree that idle PM "souping" can be an issue for some existing high-emitting locomotives. However, we do not believe it will be an issue for locomotives certified to the new standards. Even Tier 0 locomotives will be required to eliminate nearly all oil vapor from the crankcase ventilation gases, and that should virtually eliminate the "souping" issue.

Finally, we disagree with CARB that the test procedures should include cold starts. Locomotives are shut down much less frequently than other diesel engines and when they shut down they cool much more slowly because of their size. Thus cold start emissions are less important than for other sectors. Moreover, including cold starts in our test procedure would complicate in-use testing because it would require that a locomotive be shutdown several hours before each test and forcibly cooled to room temperature.

4.7.2.4 Pre-Test Locomotive Idling

What Commenters Said:

EMD stated that EPA has not explained the reason for changing the time for the pre-test idle from 15 minutes maximum in Part 92 to 10 to 15 minutes in Part 1033. The commenter noted that the amended Part 92 requirement recognized that many engines have control system features that prevent the engine from coming to lowest idle speed until specific criteria are satisfied, commonly oil temperature limits. The commenter noted that since the lowest idle speed is also the first mode of the test procedure, there is no reason to wait for ten minutes to pass, as might be interpreted from the Part 1033 table, until the test procedure can be started. EMD recommended reverting to the "15 minutes maximum (after engine speed reaches lowest idle speed)" requirement of Part 92; this would allow for immediate starting of the Federal Test Procedure, and would expedite running of the emissions tests.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We have revised the regulations in response to EMD's comment. The final regulations specify different provisions for locomotives based on whether they include catalytic aftertreatment. For locomotives not equipped with catalysts, manufacturers may begin the test as soon as the engine reaches its lowest idle setting. For catalyst-equipped locomotives, the regulations still specify that the test must be started after 10 to 15 minutes of idle. This is because pre-test idling can impact the measured emissions, and allowing widely variable idle times would adversely affect repeatability. However, EMD is correct to note that a locomotive may not reach its lowest idle setting within 15 minutes. To address this, we will allow manufacturers to begin the test in normal idle mode if the engine does not reach its lowest idle setting within 15 minutes. When they start in normal idle, they would then run the low idle mode as the second mode.

4.7.2.5 Timing of Notch Changes

What Commenters Said:

EMD commented that it has two comments regarding provisions of paragraph 1033.510(c). EMD stated that it believes the language would seem to disallow stopping for analyzer range changes or draining, purging, zeroing and spanning, data downloads, or other requirements. The commenter also stated that paragraph 1033.510(c)(5) for discrete-mode steady-state emissions test states that proportional sampling of PM emissions begins at the beginning of each sampling period and terminates once the minimum time in each test mode is reached, with a tolerance of plus or minus five seconds. EMD stated that this paragraph seems to indicate that EPA wants the sampling time for PM testing to be 300 seconds for all modes except Notch 8 which would be 600 seconds. However, the commenter noted, the footnote in Table 1 of this section states that the "time in each notch and sample averaging period may be extended" (violating the tolerance requirement of §1033.510(c)(5) and the maximum mode time of Table 1) "as needed to allow for collection of a sufficiently large PM sample."

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We have revised the regulations to clarify that actions such as zeroing and spanning analyzers is allowed between modes. We have also clarified that longer sample times are allowed. However, this allowance is intended only where needed to collected a larger PM sample.

4.7.2.6 Alternative Ramped-Modal Cycles

What Commenters Said:

EMD commented that the one or two second interval between the end of one phase and start of sampling for the next phase in the example provided by EPA is insufficient, unless some type of automated particulate filter changing system is installed. The commenter further stated that there is insufficient time to do zero and spanning, draining, and purging of the gaseous analyzers that should be done at this point. EMD recommended extending the time between phases as necessary to perform required tasks in preparation for the next phase.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

Manufacturers are not strictly required to complete phase transitions within two seconds. That provision (finalized as §1033.520(e)(3)(iii)) was merely an example. Instead, manufacturers are required only to use good engineering judgment when transitioning between phases

4.7.2.7 Single Filter Testing

What Commenters Said:

EMA commented that it agrees with the strategy to increase PM filter loading for Tier 4-level engine designs by allowing the option of eliminating discrete mode filters for each individual notch setting as described in proposed section 1033.510. The commenter stated that this testing/sampling with a single PM filter used during all notch settings with a sample time for each notch setting calculated by an appropriate weighting factor (i.e., weighting factor multiplied by a minimum of 400 seconds) would eliminate the need for the individual notch DFs and notch caps for PM. The commenter also stated that PM measurements for certification, PLT, and in-use testing could all be completed under this same test procedure. EMA commented that, because the weighting factors differ for switch-duty cycle and line-haul duty cycle, the drawback would be the creation of two PM locomotive cycle tests; however, in order to reduce that testing burden, only one PM test should be required based upon the specific application (either switcher or line-haul) for which the locomotive will be commissioned.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We disagree with the request drop one of the cycles for locomotives using this option. Note that this comment only applies for Tier 3 and earlier line-haul locomotives and Tier 2 and earlier switch locomotives, where such locomotives are certified to PM FELs below 0.05 g/bhp-hr. This option is not available for locomotives certified to higher FELs, and all later

locomotives are subject to standards over only one cycle. We do not agree that running separate tests for these few locomotives is an unreasonable burden. Moreover, a manufacturer wanting to avoid repeating test could also set up its PM sample system to collect parallel PM samples during the same test.

4.7.2.8 Smoke Testing

What Commenters Said:

EMA commented that it supports the proposed smoke opacity testing provisions (see §1033.515), which have streamlined and simplified the process of smoke opacity testing, including the elimination of the normalization for smoke stack diameter.

EMD also stated that it supports EPA's proposal to eliminate the normalization requirement. The commenter also noted, however, that the requirements to orient the smoke meter light beam along the hydraulic diameter for non-circular stacks is still problematic. For the rectangular stack exits of EMD engines, the light beam may have to be oriented at twenty-five degrees to the long axis of the plume to pass along the hydraulic diameter, which could result in highly variable smoke readings.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We have revised the regulations to address testing where it is difficult to align the beam to have a path length equal to the hydraulic diameter (such as a long narrow rectangular duct). The revised regulations allow the beam to be aligned to have a different path length, provided it is corrected to be equivalent to a path length equal to the hydraulic diameter.

4.7.2.9 Dynamic Brakes

What Commenters Said:

EMD stated that the requirement to test locomotives at the dynamic brake points is ambiguous and suggests that EPA modify the regulatory text to require manufacturers to test locomotives at the dynamic brake point that represents the largest portion of dynamic brake operation. The commenter noted that for most locomotives with multiple dynamic brake modes, that point will be the lowest engine speed and power mode.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1

Our Response:

We have revised the regulations to specify how to test when it is not obvious which dynamic brake setting represents worst case. Manufacturers may either measure emissions and power at each dynamic brake point and average them together, or measure emissions and power at the dynamic brake point with the lowest power.

4.7.2.10 Testing Temperature Range

What Commenters Said:

EMD commented that it supports EPA's proposal to narrow the temperature range for a valid emissions test to 60 to 105 degrees Fahrenheit.

MotivePower requested that EPA maintain the locomotive testing temperature requirement at the current minimum level of 45 °F. The commenter stated that it does not believe that EPA has presented any data to justify raising the minimum test temperature to 60 °F (§1033.504), and the commenter is concerned that this change will impact the number of days per year that it can perform locomotive tests. The commenter stated that, at a minimum, this raised minimum temperature requirement will add administrative overheard that could significantly reduce its opportunity in the locomotive emissions testing market.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
MotivePower

Our Response:

One of the primary reasons we previously established a broad temperature range was to allow outdoor testing of locomotives. In implementing the prior regulations, we found that the broad temperature range with correction, which was established to make testing more practical, was problematic. Given the uncertainty with the existing correction, manufacturers have generally tried to test in the narrower range being adopted here. Narrowing the range allows us to eliminate the temperature correction, which was a significant source of uncertainty. Nevertheless, we recognize MotivePower's concern. That is why we are allowing testing at lower temperatures, provided the manufacturer develops correction factors specific to their locomotive designs. Until such time as the manufacturers can develop their own corrections, we will allow them to use the temperature correction in Part 92 for tests conducted between 45°F and 60°F.

4.7.2.11 Alternator/Generator Efficiency for Locomotive Testing

What Commenters Said:

With regard to the request for comment on whether or not EPA should specify more precisely how to determine alternator or generator efficiency for locomotive testing, EMD noted that a requirement already exists in Part 92 that the alternator or generator efficiency must be specified at each test point, and that the means of determining the efficiency be described to EPA. The commenter urged EPA to require that efficiency be determined and applied separately for each test mode; as this has been its practice from the start of their emissions testing for EPA. The commenter stated that it has found that generator and alternator efficiencies can vary widely over the operating range of a locomotive engine and transmission, and accounting for the variation is important for accurate emissions determination. At the same time, EMD urged EPA not to be too prescriptive in specifying the means of determining alternator or generator efficiency, as testing of efficiency is involved and expensive. The commenter noted that in practice, the efficiency determinations are combinations of experimental data and analytical calculations. The commenter instead suggested that EPA institute a requirement that manufacturers make available for EPA inspection and audit their means of efficiency determination upon request. Lastly, EMD urged EPA to recognize that a manufacturer's efficiency information, including the method of efficiency determination, any computer programs used to streamline the process of efficiency determination for specific test modes, and the resulting efficiency figures themselves, are a manufacturer work product and are proprietary to the manufacturer. The commenter stated that it believes that EPA should not impose any requirement that manufacturers disclose such information to parties outside of the manufacturer or EPA, and should be prepared to treat any efficiency information as Confidential Business Information subject to the protections of 40 CFR Part 2.

GE commented that it believes EPA should specify the Institute of Electrical and Electronic Engineers' (IEEE) Standard 115 'Test Procedures for Synchronous Machines' as the test procedure for determining alternator/generator efficiency to ensure consistent and repeatable emissions test results regardless of the venue or entity performing the test.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
General Electric Transportation (GE) OAR-2003-0190-0590.1

Our Response:

We agree that the regulations should remain flexible at this time with respect to alternator/generator efficiencies. However, in response to GE's comment, we are revising the regulations to clarify that IEEE 115 is an appropriate method to determine alternator/generator efficiencies. Nevertheless, we will continue to allow other methods consistent with good engineering judgment.

4.7.3 Marine Test Procedures

4.7.3.1 Test Duty Cycles for Marine Engines

What Commenters Said:

EMA and Caterpillar commented that propulsion engines with controllable pitch propellers should be certified to the E2 cycle. They stated that larger marine engines with controllable pitch propellers operate more like the E2 duty cycle than the C1 duty cycle which was designed for nonroad machinery, and that use of the C1 duty cycle is inconsistent with IMO MARPOL 73/78 which uses the E2 cycle. EMA further stated that the C1 cycle is especially problematic for large engines which have little or no lug capacity causing the intermediate speed to be well below rated torque. This makes the cycle emission numbers (in g/bkW-hr) very high even though the actual emission rate in grams/hour at the intermediate speed is low due to the low power capability. Industry recommended that the C1 cycle should not be required for controllable pitch applications, but could remain an option for manufacturers.

EMA and Caterpillar commented that larger engines designed for use with controllable pitch propellers often have a combinator line (recommended maximum propeller loading at part speed) that is well below the cubic propeller curve used in the E3 duty cycle. Caterpillar provided an example of a combinator line which is the intended operation for propulsion efficiency and is a power limit intended to protect the engine. For this reason, industry recommended the E2 duty cycle for these engines. In later conversations, industry acknowledged that engine designs using controllable pitch propellers vary and expressed support of using the E3 duty cycle for engines that are designed to be able to operate on this test cycle.

Caterpillar recommended a method of distinguishing between engines using an E2 versus an E3 duty cycle based on the maximum part speed power limit line. The maximum part speed power limit line is defined as the manufacturer's recommended maximum power limit line at less than rated speed for operation for periods of a minimum of 30 minutes without interruption. The E2 test cycle would then be used if the maximum part speed power limit line is less than the cubic demand line through rated speed and power for any speed. Caterpillar explained that if the manufacturer's limit line for 30 minutes of continuous operation is above the cubic demand curve, then the limit line for unlimited operation is likely to be close to the cubic demand curve. As a result, the recommended combinatory curve will be closer to a cubic demand than to constant speed operation.

EMA commented that manufacturers currently design, certify, and perform durability testing on all marine engines less than 37 kW using the E3 duty cycle with no distinction between recreational and commercial applications. EMA expressed belief that the E3 duty cycle is representative of in-use operation of these engines and that there is no documentation validating that the 6-mode cycle is more representative of the marine engine applications. Therefore, EMA concluded that all engines less than 19 kW should continue to use the E3 duty cycle rather than the proposed G2 duty cycle and that manufacturers should not be required to use the E5 duty cycle in recreational applications for engines less than 37 kW. EMA also

commented that marine engines between 37 and 75 kW are currently designed, certified, and durability testing using either the E3 or E5 duty cycle and that EPA should allow certification on using either the E3 or E5 duty cycle dependent on durability and operational mode data from the in-use application.

EMA commented that the E3 duty cycle should also apply to propeller-law auxiliary engines as currently specified in §94.105(b). They explained that the existing provision provided alignment with IMO Annex VI.

EMD identified two concerns about marine ramped-modal test cycles. First, the proposed regulations specify a mode order that is different from the requirements of 8178-4. Second, the specified mode order makes it more difficult to certify the same, or very similar, engines as both locomotive and marine engines. The commenter noted that the locomotive ramped modal cycle starts at low power and ascends, notchwise, to the rated power and speed of the engine. The transients reflect the orderly progression of power that might be applied by an engineer as the train accelerates. The large transients in the marine ramped modal cycles, by contrast, are likely to require additional development effort, and revised components, in order to cause engines originally designed for locomotives to conform to marine engine standards. EMD urged EPA to revise the mode order in ramped modal cycles for Category 2 engines to more closely reflect the mode order in ramped modal cycles for locomotives.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Manufacturers pointed out two inconsistencies between the proposal and existing requirements for marine engines. These inconsistencies included the proposed duty cycles for marine propulsion engines less than 37 kW and the proposed duty cycle for propeller-law auxiliary engines. We agree that the existing E3 duty cycle should be used for these applications and have corrected this in the final rule.

We agree with manufacturers that the C1 duty cycle was not designed to represent variable-speed propulsion engines intended for use with variable-pitch or electrically-coupled propellers. Caterpillar provided an example of a power curve for a variable-speed engine designed to operate with a controllable pitch propeller where the operation is limited at low and mid-range speeds. In this case, we agree that the E2 test duty cycle, combined with the NTE requirements, is more representative of the operation of this engine than the proposed C1 cycle. For this engine, the power and torque at the C1 intermediate speed is relatively low, leading to a heavy weighting of low power operation. In addition, the power limit curve, for overload protection, is at lower power than even the E3/E5 duty cycles.

Controllable pitch propellers are also used with variable speed engines that have power

curves that are more similar to those seen for nonroad engines or marine engines used with fixed pitch propellers. We are concerned that the E2 duty cycle would not be representative of the operation of these engines. Therefore, we are finalizing the E3/E5 duty cycles for variable-speed propulsion engines intended for use with variable-pitch or electrically-coupled propellers. In the case where the engine is not capable of operating over the E3/E5 duty cycle in-use, the E2 duty cycle would be used. For the purposes of this requirement, we consider an engine capable of operating over the E3/E5 duty cycles if the engine is intended to be able to operate for at least 30 minutes, continuously, at the power specified in the E3/E5 duty cycles at 63, 80, and 91 percent of maximum test speed. (See §1042.505(b)(1).)

Although variable-speed engines with controllable pitch propellers may operate at speed/power operation off the E3/E5 or D2 cycles, we believe that this option is captured by the NTE standards, described below, for variable-speed propulsion engines intended for use with variable-pitch or electrically-coupled propellers. We are not finalizing an option for using the C1 duty cycle for these engines except in the case where the engine is certified to the nonroad standards and is simply dressed, without affecting emissions, for use in marine applications. We are concerned that this option will add complexity to the test program and provide an incentive for manufacturers to pick and choose which engines will perform better on the C1 duty cycle.

Table 4.7.1 presents the final test duty cycles for marine engines. The designations for the test cycles are based on those given in ISO 8178-4.

Table 4.7.1: Test Duty Cycles for CI Marine Engines

Use	Speed	Propeller[a,b]	Application	Power	Test Cycle
propulsion	variable	fixed, or E3 VP/EC	all	<37 kW	E3
		fixed, or E3 VP/EC	commercial	≥37 kW	E3
		fixed, or E3 VP/EC	recreational	≥37 kW	E5
		E2 VP/EC	all	all	E2
	constant	VP/EC (all)	all	all	E2
auxiliary	variable	non propeller law	all	<19 kW	G2
		non propeller law	all	≥19 kW	C1
		propeller law	all	all	E3
	constant	all	all	all	D2

[a] VP/EC means variable-pitch or electrically-coupled propellers.

[b] E3 VP/EC means capable of operating on E3 propeller curve, else, E2 VP/EC.

With respect to EMD's comment, the order of modes in the ramped modal cycle for marine engines was intended to be consistent with the ramped modal cycles for other nonroad engines in Part 1039. At this time, we believe that consistency with Part 1039 is appropriate and thus are finalizing the cycle as proposed. Nevertheless, we will continue to monitor this issue as more manufacturers begin to use ramped modal cycles and may reconsider the order in a future rulemaking. In the mean time, since the ramped modal cycle is optional, manufacturers that do not approve of the cycle will not be required to use it.

4.7.3.2 Engines Used in Multiple Applications

What Commenters Said:

EMA commented that a given engine that is used in multiple applications would have to be tested over multiple duty cycles under the proposal. EMA commented that testing a given engine over multiple test cycles would be burdensome. Under this scenario, EMA expressed concern that engines in the same family rated more than 19 kW could operate in any one of the 6 possible test modes for over 19 kW marine engines. They argued that this is an entirely disproportionate testing burden considering that nonroad engines, of which there are many more produced annually having many different types of uses, are all tested on one test cycle, the C1 test cycle. Manufacturers commented further that all heavy-duty on-highway engines are tested on identical cycles, regardless of vehicle type or service class.

Therefore, EMA proposed the following: marine engines should be certification tested on the test cycle that represents the most common use of the engines in the engine family based on engine sales. This is consistent with 40 CFR 86.094-21 (b)(5)(iii), which requires only one primary intended service class, based on sales. Similarly, in-use testing should be conducted in applications representative of the cycle used for certification testing. EMA also recommended that EPA adopt this proposal for Tier 2 engines as well.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

As described above, we are making changes from the proposed set of test duty cycles for marine engines. As a result, we do not believe that the final test cycles would result in a burdensome array of multiple tests for engine manufacturers. With these changes, an engine with a given calibration is unlikely to be used in multiple applications that require different test cycles. For instance, an engine used with both fixed pitch propellers and variable pitched propellers (or propeller law auxiliary applications) could be tested on the E3 duty cycle. Also, a propulsion engine certified as a commercial engine may be used in both commercial and recreational applications. Many other applications require a unique calibration, such as engines used with variable-pitch or electrically-coupled propellers approximating the E2 cycle, and would require an emission test specifically for this calibration. In the case of a constant speed engine used for both propulsion and auxiliary applications, the E2 test modes are contained within the D2 test cycle and do not require additional testing. In addition, the final test procedures for auxiliary engines do not result in a change from existing requirements

4.7.3.3 Maximum Test Speed

What Commenters Said:

EMA noted that the NPRM uses the definition of Maximum Test Speed from Part 1065. For engines less than 37 kW, the maximum test speed was defined in Part 89. Under the proposal, effective in 2009, engines less than 37 kW would have to be designed and certified to an alternate definition of maximum test speed. EMA requested that sufficient lead time would be needed to allow implementation of the changes that will take place for nonroad engines in 2008, and to allow for the transition of those changes to marine engines less than 37 kW. In this regard, EMA stated that sufficient lead time would be 2 years, suggesting that the effective date for the definition of maximum test speed should be 2010.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We believe that this is a reasonable request given the timing of the Tier 3 standards for marine engines less than 37 kW. Therefore, manufacturers will have the option to use the existing definition of maximum test speed, in Part 89, until the 2010 model year.

4.7.3.4 Maximum Test Power

What Commenters Said:

EMD commented that it believes that the Part 94 provision in which EPA defined maximum test power for Category 2 engines as 90 percent of the power output observed at maximum test speed with maximum fueling rate is a result of a miscommunication during a conversation between EMD and EPA during the development of the original Part 94 rule, and EMD urged EPA to correct this for Part 1042. The commenter noted general practice in the Category 2 engine market to provide engines with two power ratings, and stated that it believes that maximum test power for Category 2 engines should be defined as the power output observed at maximum test speed with maximum fueling rate, without the 90 percent factor. The commenter stated that it believes this would make the Category 2 maximum test power consistent with the maximum test power for Category 1 engines. (For constant-speed engines, maximum test speed would be the rated speed and maximum test power would be 110% of the continuous rating at that speed. For propeller-curve engines, maximum test speed would be the propeller curve speed necessary to develop the required power and maximum test power would be 110% of the continuous rating. For variable-speed and variable-load engines, maximum test speed would be that set by the engine control system and maximum test power would be 110 percent of the continuous power rating.)

Caterpillar commented that the current definition of maximum test power is different for Category 1 and Category 2 marine engines. For Category 1 engines, maximum test power is power output at maximum test speed with the maximum fueling rate possible. For Category 2 engines, the maximum test power is adjusted by a factor of 90 percent. Caterpillar commented

that the use of the 90 percent adjustment factor is inappropriate for many Category 2 propulsion engines. The commenter stated that this is appropriate for manufacturers that follow the practice of providing a demonstration of 110 percent of the rated power for each engine. However, other manufacturers set the fuel limit at rated power. Caterpillar recommended that the maximum test power should be the maximum power output observed in the case where the manufacturer's advertised rated power is equal to the nominal fuel stop power.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662

Our Response:

We finalized a definition of maximum test power for Category 2 marine engines to be the power output observed at the maximum test speed with the maximum fueling rate possible. This aligns the definition of maximum test power for Category 2 marine engines with that for Category 1 marine engines.

4.8 Test Fuels and Sulfur Adjustments

What Commenters Said:

The New York State Department of Environmental Conservation commented that it agrees with EPA's statement that fuel properties affect measured emissions, and it believes it is imperative that certification test fuel truly represent commercial fuel. The commenter stated that it believes that the 10 percent weight minimum aromatics requirement (§1065.703) is too low to represent commercial diesel fuel, and would tend to lead to an underreporting of PM emissions during certification. The commenter also stated that it believes that, to ensure representative certification emissions test results, locomotives and marine engines must be certified on the highest sulfur range diesel fuel that they are allowed to use in service. Lastly, the commenter stated that it does not believe that an additive PM correction factor (which the commenter stated was given without explanation of its derivation) would account for all emission effects associated with the differences between low sulfur diesel fuel (LSD) and ultra-low sulfur diesel fuel (ULSD).

EMA noted that the NPRM proposes that Tier 3 and later engines must be tested using ULSD. However, the commenter noted, the preamble states that ULSD could be available by 2012 in the market, while the Tier 3 standards are effective for marine engines less than 75 kW in 2009. The commenter stated that it believes that engine certification testing will not represent in-use applications and will undermine the utility of the certification data during this period. The commenter stated that ULSD for certification testing would ideally begin in 2014 with engine systems that are sensitive to sulfur content, and requested that all testing requirements start no earlier than 2012 when ULSD becomes commercially available.

MotivePower, Inc requested that EPA revise §1033.101 to make clear that ULSD is the Tier 2 certification fuel. The commenter stated that the Preamble is clear that the Tier 2 certification fuel is intended to be ULSD, however the proposed regulations require LSD as the Tier 2 certification fuel unless a correction factor is applied with ULSD test fuel.

EMD commented that the NPRM amends the existing Part 94 PM correction for test fuels outside the Part 92 2000-4000 ppm sulfur content range by adding a correction provision for tests run with LSD and ULSD—the provision allows adjustment of the PM results obtained from tests using fuel of less than 300 ppm sulfur to estimate those that would have been obtained at 2000 ppm sulfur. The commenter stated that it appears there's an omission of adjustment provisions for test fuels between 300 and 2000 ppm sulfur. The commenter questioned if this was intentional, and if the results from tests with sulfur levels in that range are to be left unadjusted. The commenter also noted that its testing indicated a correction for sulfur content only about fifty-five percent as large as that calculated by the equation in the proposed paragraph §94.108(d)(2)(ii); the commenter recommended the use of an equation derived from its own testing: $S_{PM\ adj} = 10.858(0.0020\text{-}FSF)$ (where, $S_{PM\ adj}$ = PM sulfate adjustment (g/kW-hr), FSF = Test fuel sulfur weight fraction). EMD also discussed the proposed adjustment factor of 0.07 g/bhp-hr in §92.12(i) for particulate results obtained with low sulfur diesel (LSD) or ULSD. EMD recommended adjustments to this factor in place of that proposed §92.12(i). Lastly, the commenter stated that it believes that EPA's proposed adjustment is overstated by a factor of approximately two to three of the sulfate particulate emissions change with a fuel sulfur reduction (in Draft RIA equation 3-4) may mean that EPA has overestimated the particulate inventory effect of its fuel sulfur reduction program by the same amount, if equation 3-4 is used in the calculation. EMD recommended taking the certification test fuel sulfur content all the way to ULSD, as the locomotives that would be certified using it will spend the majority of their lives on ULSD, or on fuel of higher sulfur content that has been contaminated somewhat after June 1, 2012.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0594.1
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
MotivePower, Inc. OAR-2003-0190-0613
New York State Department of Environmental Conservation, Office of Air Resources OAR-2003-0190-0583.1

Our Response:

We disagree with New York's comment that the aromatics content specification in §1065.703 is inappropriate. It is important to note that this specification is a *minimum* value of 10 percent. We believe aromatics levels that low do occur for in-use fuels and that the minimum value is appropriate.

We agree with EMA that manufacturers should be allowed to use higher sulfur fuels as the test fuel for Tier 3 engines. We are modifying the regulations to allow this. However, no correction will be allowed for the effect of higher sulfur level on PM emissions.

We believe MotivePower's comment represents a misunderstanding of the regulations. The test fuel for the new Tier 2 standards under Part 1033 is ULSD, but the specified test fuel for locomotives certified to the old Tier 2 standards in Part 92 remains high-sulfur fuel.

We have revised our sulfate adjustment factors based on newer data, including those provided by EMD.[4] The new values are lower than proposed but higher than recommended by EMD. It is also important to note that manufacturer may continue to test using the specified fuel without correction.

Finally, we agree with New York that the use of ULSD instead of LSD can effect emissions in ways other than the effect on sulfate PM emissions. However, we do not believe manufacturers should be required to correct for them. We expect these effects to be quite small or even undetectable. In addition, we expect the engines in question to use ULSD most of the time.

4.9 Marine NTE

4.9.1 General Comments on Revisiting NTE Standards

What Commenters Said:

EMA commented that it strongly supports revisiting the applicable NTE requirements. The commenter noted that during the Tier 2 rulemaking, EPA recognized that the NTE requirements were directed primarily at the control of NOx emissions and that there was limited information available relating to the impacts of the NTE requirements on PM and CO emissions (the commenter cited an excerpt from the rule's 1999 analysis of comments). The commenter thus believes that the NTE standards should be focused on ensuring that "off-cycle" emissions are reduced in a reasonably proportional manner to the cycle-based numbers, and should only address off-cycle operations that are experienced for a significant amount of time. EMA further commented that it believes that including engine operations in the NTE zone that are only occasionally experienced on some vessels can frustrate the overarching objective of developing clean, reliable marine engines with low fuel consumption and low carbon dioxide emissions.

EMA commented that all marine diesel engines are turbocharged, except for the smallest engines, and most are very highly boosted. The commenter stated that the natural characteristic of a turbocharged engine operating along a propeller demand curve (cubic power demand with speed) is to have high air-fuel ratios at very low speeds where the bmep is low and the naturally-aspirated breathing capability of the engine is sufficient to provide the combustion air with little or no aid from the turbocharger. The commenter also noted that at high speed (and high load) on the cubic demand, the turbocharger is up at full speed and providing plenty of air for

4 "Analysis of Fuel Sulfur Conversion Rates in Locomotives", Charles Moulis, USEPA, Memorandum to Docket EPA-HQ-OAR-2003-0190-0852, February 20, 2008.

combustion, and the bmep is the highest at full speed on the propeller demand line, but the turbocharger is operating at high boost. Brake specific emissions (g/bkW-hr) increase for all species at lower loads, because friction becomes a greater percentage of the indicated mean effective pressure and injection systems designed to provide sufficient fuel at rated speed are run at a large turn-down.

Caterpillar commented that it strongly supports revisiting the NTE requirement. The commenter noted that during the Tier 2 rulemaking, EPA recognized that the NTE requirements were set up primarily around NOx, and that there was limited information available on particulates and CO. The cycle emission numbers take into account average vessel operation. Emission effects are due to average operation over a period of time from a number of emission sources. This is reflected in the structure of the ambient air quality standards with long averaging times (hours to days to annual). The cycle limits should be the primary emphasis of the emission control effort. The NTE requirements should not be the stringency-setting portion of the rule. The commenter stated that some sort of NTE approach may be useful for making sure that the off-cycle emissions are reduced in a manner reasonably proportional to the cycle numbers, and the NTE should only address operation off-cycle that is seen for a significant amount of time. The commenter further stated that it believes that occasional operation will not be significant from an air quality standpoint. Including operation in the NTE zone that is only occasionally seen on some vessels distracts from the desirable goals of having clean, reliable marine engines with low fuel consumption and low carbon dioxide emissions. Caterpillar noted that EPA and industry have been able to examine the NTE issue in much more detail and there is much more information than was available in the previous rulemaking that established the original zones and factors, which were based on very limited data.

Environmental Defense, NRDC, et al. commented that they strongly support the proposal to close the gap in emissions control technologies and real-world emissions performance between commercial marine diesel engines and other similarly-sized diesel engines. The commenters also stated that they support the introduction of a strong NTE limit on all marine engines, just as emissions from highway and nonroad diesel engines are now capped by such NTE limits.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1
Environmental Defense, et al. OAR-2003-0190-0592.1

Our Response:

Since the NPRM, we continued to engage the manufacturers to seek better understanding of these issues. We agree with the comments that some additional work was needed on the proposed NTE requirements to better address specific engineering issues related to marine engines. As discussed in the remainder of this section 4.9, we modified the proposed NTE zones and standards to address these issues, while maintaining the basic structure of the proposal and achieving the same effectiveness as the proposed NTE requirements. We also agree with

comments supporting the need for the NTE limits.

4.9.2 Constant Speed Engines

What Commenters Said:

EMA commented that further review is necessary of the NTE zone associated with the D2 and E2 test duty cycles. EMA and Caterpillar commented that the proposed split between sub zones 1 and 2 seemed reasonable. Caterpillar stated that the proposed methodology for calculating the NTE zone would require engine mapping beyond what is necessary for performing the constant speed duty cycle testing. They recommended that the NTE zone definition be simplified to engine power above 40 percent of maximum test power. Correspondingly, they recommended dividing the sub zones at 70 percent of maximum test power for constant speed engines.

EMA and Caterpillar commented that the sub zone 1 NTE limits for constant speed engines appear to be reasonable. However, they recommended that the NOx limit be above 1.4 for sub zone 2 and that the PM and CO factor should be above 2.2. EMA and Caterpillar supported the proposed exclusion of a PM limit in sub zone 2 for engines with PM FELs at or above 0.07 g/kW-hr.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We agree that calculation of the NTE zone for constant speed engines would be simplified by using the approach recommended by industry. In addition, this approach does not significantly alter the basic shape of the NTE zone. Therefore, we are finalizing an NTE zone, for constant speed marine engines, that includes all operation above 40 percent of maximum test power at the governed speed. Sub zone 1 includes all operation above 70 percent of maximum test power at the governed speed. The remainder of the NTE zone for constant speed engines is denoted as sub zone 2.

Since the NPRM, manufacturers have shared additional information on the emissions characteristics of their engines. Using this additional information, we have further analyzed the feasibility of the NTE standards for Tier 3 and Tier 4 constant speed engines. Based on this analysis, we believe that slightly higher multipliers are appropriate for sub zone 2 of the NTE zone for constant speed marine engines. Therefore, we are applying the proposed Tier 4 multiplier of 1.5 HC+NOx to Tier 3 engines as well. Further, we are finalizing a limit of 1.9 for PM and CO in sub zone 2. We are also finalizing the proposed exclusion of a sub zone 2 PM limit for engines with an FEL at or above 0.07 g/kW-hr, which will apply to most Tier 3 engines.

4.9.3 Fixed-Pitch Propulsion Engines

What Commenters Said:

EMA and Caterpillar commented that they agree that the proposed NTE zone shapes are appropriate given the expected operation of engines used in fixed-pitch propeller applications and that it supports the adjustment to the NTE multipliers to account for the Tier 3 and Tier 4 duty cycle limits. EMA and Caterpillar commented that, given the inherent emission characteristics of marine engines, they strongly support the proposed changes to the NTE zone for fixed pitch propellers as a more accurate reflection of the operation of an engine in a marine vessel. The commenters noted that the previous NTE zone for fixed pitch propellers appeared to be based on a construction machine or on-highway vehicle engine, where the engine powered the vehicle through a transmission. EMA stated that it believes that the NTE factors for the fixed pitched application are much more representative of the operation of a turbocharged diesel engine compared to the Tier 2 rules. (EMA however stated that it believes that the factors remain lower than the data shows they should be, but that these factors are still much more accurate.) Caterpillar stated that it believes that the NTE factors for the fixed pitched application are much more representative of the operation of a turbocharged diesel engine compared to the Tier 2 rules, but that the factors remain lower than the data shows they should be. EMA and Caterpillar urged EPA not to eliminate or reduce the NTE factors for the Tier 4 standards. They stated that properly determined NTE factors will reflect the emission characteristics of engines and provide assurance that the overall emissions reductions expected from reductions in the cycle-based emissions are attained in real-world applications. EMA and Caterpillar commented that eliminating or reducing the NTE factors for Tier 4 would make the NTE portion of the rule the most stringent portion of the standard, as opposed to the cycle-based limits.

EMA commented that, for engines less than 75 kW, the NPRM creates separate NTE zone requirements for recreational and commercial propulsion engines. The commenter stated that it believes that multiple NTE requirements, and the possible requirement of the 6-mode test cycle for engines less than 19 kW, threaten to create a burden (presumably unintended) to design new marine engine products that perform to meet all these requirements. The commenter stated that it believes this burden is also increased since these smaller marine engine products are derived from nonroad engines that have their own unique NTE requirements. The commenter stated that it believes that any significant differentiation in the NTE requirements prevents the orderly transfer of technology that is necessary for meeting the proposed stringent Tier 3 standards. EMA recommended that the NTE zone based on the E3 duty cycle be used for engines less than 19 kW to create a static requirement that is representative of applications and moves towards a path of harmonization. The commenter also noted that a single NTE zone requirement is consistent with its request to use the 4-mode marine test cycle for all engines less than 19 kW. The commenter also recommended that the NTE zones associated with the E3 and E5 duty cycles be used for engines between 19 and 75 kW.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We are finalizing the NTE zones and standards associated with the E3 and E5 duty cycles as proposed. We believe that the proposed NTE zone and limits for these engines reflect the best information on in-use operation and anticipated emission control technology for marine diesel engines. As discussed above, we are finalizing the use of the E3 and E5 duty cycles for fixed-pitch propulsion engines ≥37 kW and the E3 duty cycle for fixed-pitch propulsion engines <37 kW. Therefore, the NTE zones based on the E3 duty cycle will apply to smaller engines and manufacturers should not experience any significant differentiation in the NTE requirements when transitioning to the Tier 3 standards.

4.9.4 Variable-Pitch or Electronically-Coupled Engines

What Commenters Said:

EMA and Caterpillar commented that the operation of marine engines is much different than that of nonroad equipment and recommended that EPA make a similar effort in addressing the NTE zone for other cycles as was made for engine operation with fixed pitch propellers.

EMA and Caterpillar commented that they believe that the proposed NTE zones and factors for variable speed and load applications and for constant speed marine auxiliary engines would make the NTE portion of the proposed standards more stringent than the cycle-based emission limits. The commenters stated that they specifically do not believe the proposed zones and factors reasonably reflect the PM and CO values that are observed from these types of engines. EMA commented that the NTE zones and factors for fixed pitch propulsion engines are somewhat representative of their operation, but that the factors proposed for variable speed and load engines and constant speed engines are not.

Working from the nonroad NTE zone, EPA and Caterpillar requested larger sub zone 2 which would include operation below a line extending from 50 percent power at the lower speed end of the proposed NTE zone (E speed) through 70 percent of power at maximum test speed. They also recommended higher NTE limits for subzone 2.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

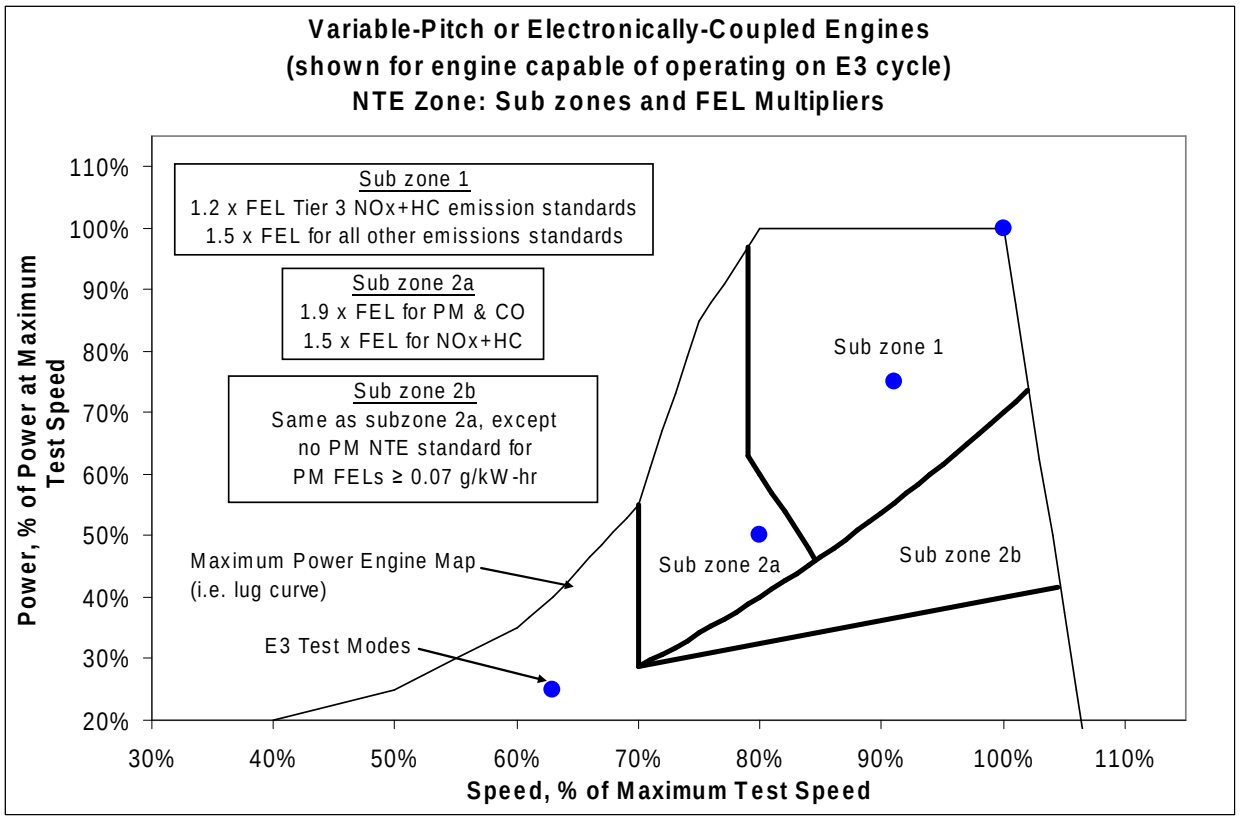
Our Response:

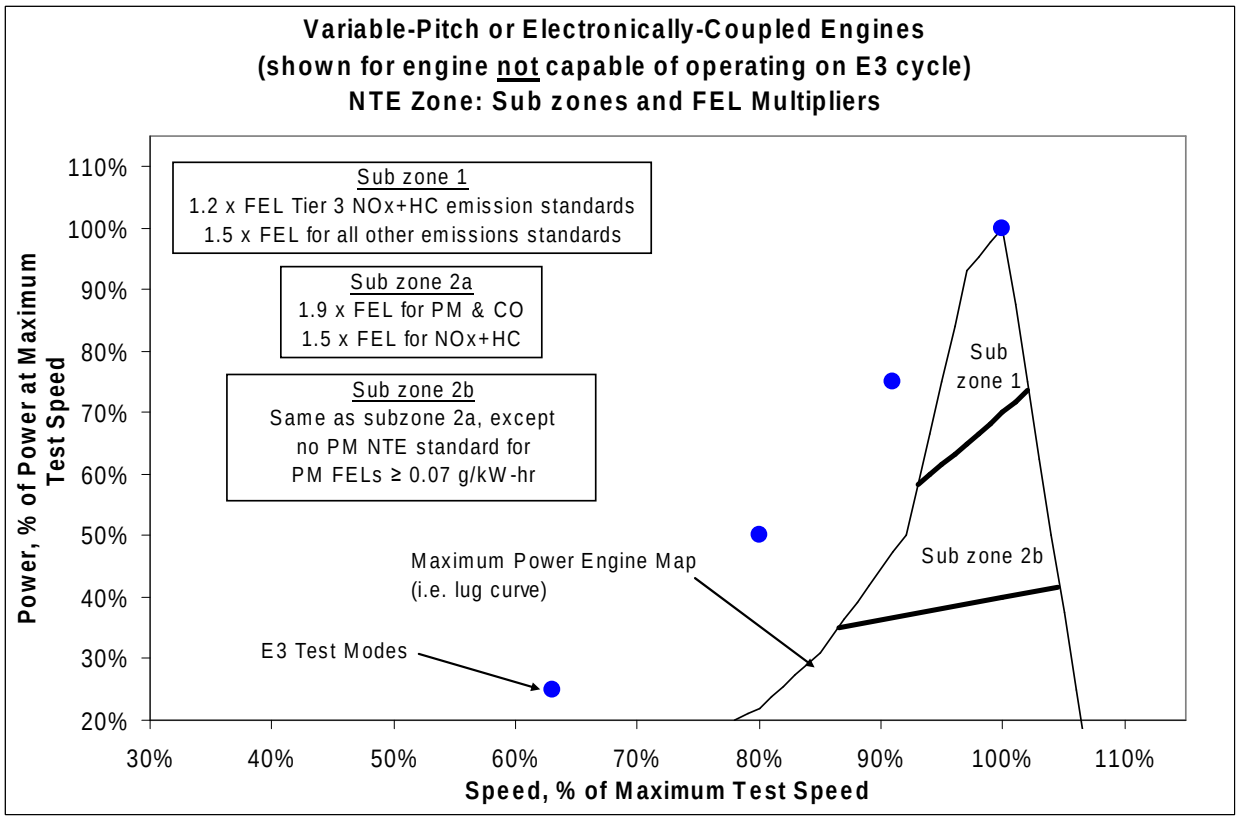
After the comment period, we continued to work with the marine engine manufacturers to better understand the unique characteristics of these engines. As discussed above, applications using variable-pitch or electronically-coupled engines vary greatly. In some applications, the engine may operate similar to a fixed pitch propeller engine and others more

similar to a constant speed engine. In addition, some engines may operate over a wide range of speed and loads more similar to a nonroad engine.

With these engine characteristics in mind, EPA worked with industry to develop a revised NTE zone and limits that better reflect marine applications. To do this, we started with the proposed NTE zone and limits for engines certified to the E3 and E2 duty cycles. Specifically, we include the entire E3 NTE zone and all operation at power levels greater than the E3 zone to reflect the capability of engines to operate along the power curve. We also included operation below the E3 zone but above a line extending through the lowest power/speed corner of the E3 NTE zone and 40 percent power at maximum test speed. This lower power limit is consistent with the NTE zone for constant speed engines and was intended to capture the lower power operation presented in Caterpillar's comments.

Although a single NTE zone is used for all variable-pitch or electronically-coupled engines, this zone varies in appearance by power curve. For an engine capable of operating over the E3 duty cycle, it approaches the NTE zone for nonroad engines. In this case, the NTE limits are based on a comparison to the E3 duty cycle results. For engines that are not capable of operating over the E3 duty cycle, and are better reflected by the E2 duty cycle, the NTE zone and limits approach those for constant speed engines. In this case, the NTE limits are based on a comparison to the E2 duty cycle results. The following two figures present the NTE zone and limits and give an indication of how the shape of the zone is affected by the power curve of the engine.


Variable-Pitch or Electronically-Coupled Engines
(shown for engine capable of operating on E3 cycle)
NTE Zone: Sub zones and FEL Multipliers
Sub zone 1
1.2 x FEL Tier 3 NOx+HC emission standards
1.5 x FEL for all other emissions standards
Sub zone 2a
1.9 x FEL for PM & CO
1.5 x FEL for NOx+HC
Sub zone 2b
Same as subzone 2a, except
no PM NTE standard for
PM FELs ≥ 0.07 g/kW-hr
Maximum Power Engine Map
(i.e. lug curve)
E3 Test Modes
Sub zone 1
Sub zone 2a
Sub zone 2b
Power, % of Power at Maximum Test Speed
Speed, % of Maximum Test Speed
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
30%
40%
50%
60%
70%
80%
90%
100%
110%


Variable-Pitch or Electronically-Coupled Engines
(shown for engine not capable of operating on E3 cycle)
NTE Zone: Sub zones and FEL Multipliers
Sub zone 1
1.2 x FEL Tier 3 NOx+HC emission standards
1.5 x FEL for all other emissions standards
Sub zone 2a
1.9 x FEL for PM & CO
1.5 x FEL for NOx+HC
Sub zone 2b
Same as subzone 2a, except
no PM NTE standard for
PM FELs ≥ 0.07 g/kW-hr
Maximum Power Engine Map
(i.e. lug curve)
E3 Test Modes
Sub zone 1
Sub zone 2b
Power, % of Power at Maximum Test Speed
Speed, % of Maximum Test Speed
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
30%
40%
50%
60%
70%
80%
90%
100%
110%

4.9.5 Variable Speed Auxiliary Engines

What Commenters Said:

Manufacturers commented that propeller-law auxiliary engines should be certified using the E3 duty cycle. Manufacturer comments on the associate NTE zone for the E3 test cycle are discussed above.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

For propeller-law auxiliary engines certified using the E3 duty cycle, the same NTE zone and limits will apply to these engines as for fixed-pitch propulsion engines certified using the E3 duty cycle. For other variable speed auxiliary engines, the proposed NTE zone will be applied. This NTE zone is the same as used for land based nonroad engines. In cases where the marine auxiliary engine has the same emissions design as the nonroad version of the engine, this will facilitate use of a single set of emission data for certification.

4.9.6 Governed Test Speed

What Commenters Said:

Regarding the NTE zone revisions (Part 1042, Appendix III), EMD commented that for the Propeller Law NTE Zone (Figure 1) and Variable Speed-Variable Load NTE Zone (Figure 4), EPA should make an allowance for the rightmost boundaries of the NTE zones for electronically-controlled engines to be a vertical line at maximum test speed. The commenter noted that the rightmost boundaries of the NTE zones are shown as a line with negative slope, running from 100 percent of both maximum test speed and maximum test power down to approximately 108 percent of maximum test speed at 20 percent of maximum test power. The commenter stated that this is characteristic of engines with hydromechanical governors, which reduce power as maximum speed is exceeded; the commenter further stated, however, that engines with electronic controls will follow a vertical line here as the control system will set a hard limit on speed that it will not allow the engine to exceed. The commenter noted that electronic controls are becoming widespread in the marine engine industry, and stated that it seems unlikely that it will be possible to meet the higher Tiers of emissions standards without them.

EMD also commented that for the Constant Speed Engine NTE Zone (Figure 3), there appears to be an error. The commenter noted that the NTE zone is shown as running along a diagonal line of negative slope from 100 percent of both maximum test speed and maximum test power down to approximately 108 percent of maximum test speed at 20 percent of maximum test

power. The commenter stated that the NTE zone that is shown is a variable-speed zone for a constant-speed engine; and the commenter believes that the NTE zone should run along a vertical line at 100 percent of maximum test speed.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662

Our Response:

The slope in the NTE diagrams is intended to represent governor droop for a mechanically controlled engine. When determining the test modes and NTE zones, this slope is based on the characteristics of a given engine. In the case of an electronically-controlled engine, this slope would generally be vertical. Therefore, no change is required to the proposed test procedures and NTE zones to address these comments.

4.9.7 Harmonization with ISO

What Commenters Said:

EMA stated that the International Organization for Standardization (ISO) recently adopted (in ISO 8178) the original EPA marine NTE zones as defined in Part 94. The commenter expressed concern that future misalignment in emissions standards and design requirements could result from the NTE zone differences in ISO 8178 and Part 1042. The commenter suggested that efforts be made by the appropriate parties to revise the ISO NTE zones so that they are aligned with those defined by Part 1042 once the rule is finalized.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We will continue to engage in discussions related to ISO standards and will support the use of the new marine NTE zones.

4.9.8 Ambient Temperature

What Commenters Said:

EMA and Caterpillar commented that the lower temperature limit for locomotive testing was proposed to be 60°F and that this limit should be used for marine NTE testing as well.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822

Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Existing requirements for marine NTE testing use a lower limit of 13°C (55°F) for the unadjusted temperature range. No rationale was given by commenters why this limit should be changed from 55°F to 60°F. We believe that the NTE standards are feasible in at temperatures as low as 55°F and are not making any change to this limit.

4.9.9 Barometric Pressure

What Commenters Said:

EMA noted that the requirements of proposed section 1042.51(c)(1) extend the NTE-zone ambient conditions to include barometric pressure as a parameter in addition to air temperature, water temperature, and air humidity. They commented that this adds unnecessary cost and test requirements to the marine engine industry. EMA stated that testing and verifying for NTE-zone compliance is already an expensive part of the emission testing program, and the more parameters that are added, the more testing is required. According to EMA's comments, the vast majority of marine engines will never leave sea level and will not experience the lower barometric pressure of higher altitudes. Therefore, EMA commented that the proposed §1042.515(c) should be revised and the barometric pressure range should be deleted.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Simply deleting the barometric pressure range in the proposed regulations would open the requirements to an unlimited range of barometric pressures. Setting a pressure range that could only be achieved at sea-level would preclude engine testing in laboratories at higher elevations. As a compromise, we are revising §1042.515 to specify a generally applicable low pressure limit that represents the pressure that may be seen at 1,100 feet on a low pressure day. We believe that this pressure range is appropriate to facilitate testing of marine engines. For on-board emission testing, it is unlikely that barometric pressures outside of the proposed range would be observed. However, manufacturers located at higher altitudes would have the option to test at lower pressures.

4.9.10 Exhaust Temperature

What Commenters Said:

EMA commented that it objects to the requirement that the NTE limits for NOx emissions should apply when exhaust temperatures are as low as 150 °C. EMA did not agree with EPA's rationale that this is possible due to the predominantly steady-state operation of marine and locomotive engines. EMA stated that the advantages of steady-state operation allow for more efficient NOx reductions, not improved catalyst operation at lower temperatures. EMA also stated that it believes that the marine and locomotive requirements should be based on the transfer of technology from on-highway and nonroad applications—applications which have an exhaust temperature limit of 250 °C. Caterpillar commented that it believes that the proposed NOx catalytic aftertreatment minimum temperature of 150 °C is not achievable, even with robust SCR systems. EMA and Caterpillar objected to any NTE threshold requirement other than 250 °C for marine and locomotive engines. EMA and Caterpillar argued that the minimum temperature for the effective operation of SCR systems can be dependent on fuel sulfur levels. EMA and Caterpillar also commented that marine engines can be operated on fuels with sulfur levels significantly above 15 ppm during fuelings and operations outside of the U.S. (engines burning residual fuel could subject the catalyst to fuel sulfur levels above 10000 ppm), which will subject the catalyst surfaces to higher than recommended fuel sulfur levels, thereby requiring higher (not lower) minimum temperatures.

EMA and Caterpillar commented that they agree with the proposed requirement that the NTE limits for hydrocarbons should apply at a minimum temperature of 250 °C; they stated that the same minimum temperature of 250 °C also should apply to the NTE limits for PM as well. EMA and Caterpillar commented that the required PM reductions will need to include the organic fraction, and noted that many engines have a significant portion of the particulates from the organic fraction (as stated at 73 FR 15980). They reasoned that the organic fraction is reduced by oxidation of the hydrocarbons, and thus stated that the NTE requirements for PM should be based on the same minimum exhaust temperature that is required for the oxidation catalyst. EMA and Caterpillar further suggested that the temperature exclusions for EGR that are set forth in the Nonroad Diesel rule should be included in the marine and locomotive rules.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Based on recent research and development in urea dosing technologies that has shown that it is possible to hydrolyze urea-water solutions and create ammonia at lower temperatures than was previously observed, we proposed 150 °C as the low temperature limit for NOx for NTE testing. However, we now believe it would be appropriate to set the low temperature limit at 250 °C for NOx as well as HC, CO, and PM, to remain consistent with our on-highway and nonroad regulations (see 40 CFR 86.1370-2007 (g)), and allow for technology transfer from those sectors.

4.9.11 Stabilization within the NTE Zone

What Commenters Said:

EMA also recommended that the NTE provisions specifically account for the anticipated use of passively regenerated metallic substrate filters (metallic substrate filters in-use today rely on passive regeneration). The commenter noted that following periods of extended idle or light load or low temperature operation, exhaust temperatures must be sufficiently high to allow for filter regeneration; and once regeneration is completed, the filter is then operating at full efficiency. The commenter suggested that provisions be added to the rule to limit NTE requirements to periods after such regeneration has occurred.

EMA and Caterpillar stated that NTE testing should be excluded for a specified period (20 minutes minimum) after operation at loads below the NTE zone for periods of more than 5 minutes. The commenters argued that this will help prevent the build-up of particulate and HC on the exhaust piping during low-load operation and their subsequent release at higher loads, temperatures and flow rates, which could produce an artificially high emission reading within the NTE zone. The commenters also expressed the possibility of inaccurate measurements from the shedding of accumulated particulate in the exhaust stack due to higher temperatures and flows even if the previous operation was within the NTE zone. EMA stated that inaccurate measurements due to particulate accumulation during operation at some points and particulate shedding at other points are very likely, and specific guidelines are therefore necessary to address these important testing issues.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Our understanding of PM filter technology is that the efficiency increases, not decreases, as PM collects on the filter. Build-up on the filter helps collect further PM and hydrocarbons from passing through. Therefore, a regeneration event is not required for the filter to operate at maximum efficiency. Particulate matter that may shed off the exhaust piping during testing would not be collected by the PM sampling equipment. A cyclonic separator is used in the sampling system to separate out large diameter PM agglomerations. Typically, the cyclone is designed to separate PM over 2.5 microns in diameter. Therefore, we do not believe that it is necessary to exclude operation in the NTE zone that occurs immediately after low load operation outside of the NTE zone.

4.9.12 Steady-State Operation

What Commenters Said:

EMA and Caterpillar requested further clarification regarding the NTE testing restriction excluding the time when the operator changes demand (§1042.101). The commenters stated that there should be a clear statement that a period of time should be permitted to allow the engine to reach steady-state conditions.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

The proposed test procedures for steady-state testing stated that the sampling period may not begin until the engine has reached stable operating temperatures. An example is given that this would include only engine operation after starting and after the engine thermostat starts modulating the engine's coolant temperature. We believe that this language provides a clear statement that a period of time is required to allow the engine to reach steady-state conditions. Therefore, no changes have been made in response to this comment.

4.9.13 Guidance for Certification

What Commenters Said:

EMA noted that EPA issued NTE guidance for marine engines under Part 94 in the form of a "Dear Manufacturer Letter" (see CD-03-15); and requested that EPA create similar NTE guidance for engines regulated under Part 1042 so that engine manufacturers can verify compliance in a reasonable and consistent manner.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We believe that this request is reasonable and will work with stakeholders to provide similar guidance during the implementation of this rule.

4.9.14 Limited Testing Regions

What Commenters Said:

EMA stated that it agrees with the proposed limited testing region allowance for marine engines that already exists for on-highway and nonroad programs. Caterpillar commented that limited testing regions (LTRs) should be allowed anywhere in NTE zone and not be required to be along the NTE boundary. They stated that the LTR is only needed for PM.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We are finalizing the LTR provision which would allow a manufacturer to petition the Agency to limit testing in a defined region of the NTE engine control zone during NTE testing. This optional provision would require the manufacturer to provide the Agency with in-use operation data which the manufacturer could use to define a single, continuous region of the NTE control zone. This single area of the control zone must be specified such that operation within the defined region accounts for 5 percent or less of the total in-use operation of the engine, based on the supplied data. We are concerned that if limits are not placed on the shape of the LTR, that this provision could be abused. To protect against gaming by manufacturers, the defined region must generally be elliptical or rectangular in shape, and share a boundary with the NTE control zone. This approach is consistent with existing provisions for on-highway and nonroad diesel engines.

4.9.15 Deficiencies

What Commenters Said:

EMA suggested that the marine engine NTE provisions include the same regulatory allowances for NTE 'deficiencies' that are allowed for heavy-duty on-highway and nonroad engines. (See 40 CRF §§86.007-1 l(a)(4)(iv); 1039.515(a); 1039.104(d); and 86.1307-2007(d).) The commenter noted that, given the inherently harsh nature of the marine environment, the significant challenges inherent in the scaling-up of the anticipated aftertreatment technologies, and the inherent priority on protecting for safe and uninterrupted engine operation and performance, the potential availability of deficiencies should be extended to marine engines just as it is for other applications. EMA thus recommended that EPA consider providing more flexible deficiency allowances for marine engines, and also must ensure that any additional flexibilities that are provided for heavy-duty on-highway and nonroad engines are provided for marine engines as well.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We have determined the feasibility of the NTE standards based on the data available and our analysis of this data, and we have not considered the availability or the in-availability of NTE deficiencies in making this determination. However, in certain instances, manufacturers may need additional time to address certain areas of the NTE zone. The availability of

temporary deficiencies would help manufacturers make the transition to the new NTE requirements and standards. We are finalizing a temporary deficiency option for manufacturers similar to that which was provided for heavy-duty on-highway and nonroad engines. Under this program, manufacturers would ask us for the flexibility and would need to support why the deficiency is needed.

4.9.16 In-Use Measurements

What Commenters Said:

EMA and Caterpillar requested clarification regarding the manner in which NTE testing can be performed in-use due to the difficulty of obtaining accurate measurements of the very low levels of PM and HC dictated by the underlying very stringent emission standards.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

As described in section 4.1.8 above, we are finalizing the regulations to include in-use adjustment for marine engines to help manufacturers deal with the transition to the Tier 4 standards, including any in-use testing. We believe that this addresses EMA's concern.

4.9.17 Implementation Dates

What Commenters Said:

EMA commented that, under the NPRM, the proposed NTE requirements for smaller marine engines would come ahead of the nonroad NTE requirements; the commenter stated that this could cause significant disruptions in the transfer of technology and force manufacturers to design separate marine engine lines. The commenter also stated that it does not believe that designing and accounting for the proposed NTE requirements could be completed by the proposed effective date of 2009. EMA requested that EPA align the effective dates of the proposed marine NTE requirements with those of the nonroad regulations to allow transition of NTE-based advancements from the nonroad sector, and to facilitate the necessary downstream transfer of emission control technology.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We agree with this comment and have revised the final rule accordingly, such that marine engines will not be subject to NTE requirements before the nonroad engines from which they are derived.

4.9.18 Use of New NTE Provisions with Tier 2 Engines

What Commenters Said:

Caterpillar commented that the revised NTE zones and limits should be allowed for use on Tier 2 engine certification. They stated that this would allow a smoother transition into the new standards as manufacturers do new rating development before the Tier 3 standards apply. Correspondingly, Caterpillar commented that the duty cycles described above for engines used with controllable pitch propellers should be allowed for Tier 2 engines as well.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1, 0822

Our Response:

We believe that allowing the earlier use of the new duty cycles and NTE zones and limits would provide flexibility in making the transition to the new standards. Therefore, manufactures will be able to request approval for the early use of the duty cycles and NTE specifications that apply for Tier 3 or Tier 4 engines. We will approve these requests where the manufacturer can demonstrate that it would not affect compliance with the applicable emission standards. This generally would require that the combined provisions would result in better control of emissions or that combined effects of the procedures is small relative to the degree to which the engines are below the applicable standards.

4.9.19 Infrequent Regeneration During NTE Testing

What Commenters Said:

EMA noted that for engines equipped with infrequently regenerating aftertreatment devices, certification test changes in emission levels during regeneration events are accommodated by adjustment factors as determined in 40 CFR §86.004-28(i), §1039.525, and §1042.525. The commenter further noted that for on-highway engines, the impact of regeneration on NTE tests is accommodated by adjusting the averaging period in §86.1370-2007(d)(2). EMA noted that the on-highway allowances for nonroad engines are incorporated in §1039.515(a), and stated that it believes that this new rulemaking also needs to accommodate these changes—the commenter suggested that the following language be added to proposed §1042.515(a): “The provisions in 40 CFR 86.1370-2007 apply for determining whether an engine meets the not-to-exceed emission standards in §1042.101(c). Interpret references to vehicles and vehicle operation to mean vessel and vessel operation.”

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

We agree with the concept behind EMA's comment and have added a new paragraph (g) to §1042.515 to address this comment.

4.10 Other Issues

4.10.1 Plain Language

What Commenters Said:

EMD commented that it understands EPA's rationale for the structure of the 1000-series Parts of Title 40, but noted that it poses a difficulty for manufacturers. The commenter noted that separation of the compliance and test procedure parts from the standard-setting parts burdens manufacturers with monitoring rulemakings affecting sources unrelated to a manufacturer's own products. The commenter gave the example that when 40 CFR Part 92 was finalized, the testing procedures and the compliance provisions were set for locomotives and manufacturers would not be subject to modifications to those procedures unless and until a new locomotive rulemaking was undertaken. The commenter noted that with the new structure, whenever EPA undertakes a rulemaking activity, there is potential for modification of the testing and compliance procedures that could affect manufacturers of all sources. The commenter further gave the example that this will require manufacturers of locomotives and Category 2 marine engines to monitor and potentially become involved in rulemakings affecting other engines and equipment in order to be aware of (and possibly to comment on) changes that would affect their operations in order to maintain compliance. EMD urged EPA to give some thought to how it will make sure that all stakeholders are aware of activities under this new rule structure that could result in a manufacturer becoming noncompliant, not through ignorance, but through simply having missed a change that had taken place in rules affecting its operations. EMD also requested additional clarifications in another comment.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662

Our Response:

We understand the concerns raised by EMD, however we do not believe they warrant abandoning the new regulatory construct, which provides other important benefits. For example, for manufacturers that produce engines for more than one engine category, the new construct allows the use of common procedures across these categories.

All changes to these common regulations will be made only through public rulemakings published in the Federal Register. In addition, we generally make great efforts to reach out to all affected stakeholders in such rulemakings.

We have made clarifying revisions to the regulations where possible. It is also important to note that the proposed §§92.12(j) and 94.12(i) were included to provide manufacturers the flexibility needed to transition to the new regulations.

4.10.2 Gas Turbines

What Commenters Said:

The New York State Department of Environmental Conservation noted that marine turbine engines can operate on the same fuel as traditional diesel marine engines. The commenter stated that it believes that excluding turbine engines from regulation could have the unintended consequence of shifting the marine vessel power toward turbines, which could result in negating the emission reductions promised by this proposed rulemaking. The commenter stated that this concern also applies to Category 3 marine engines. The commenter suggested that it may be necessary for EPA to address marine gas turbine engines in a separate rulemaking, in order to avoid undesirable delay in this rulemaking.

Letters:
New York State Department of Environmental Conservation, Office of Air Resources
OAR-2003-0190-0583.1

Our Response:

We disagree with the assertion that we are excluding turbine engines from regulation. As noted in the preamble, we are addressing turbine engines in a separate rulemaking.

4.10.3 Non-OEM Remanufacturing and Part Suppliers for Locomotives

What Commenters Said:

The Coalition of Aftermarket Rail and Marine Engine Suppliers (CARMES) commented that t it believes the proposed regulations currently favor the OEM engine suppliers over aftermarket suppliers in a manner that places an unfair burden on the aftermarket suppliers. The commenter presented some additional points for EPA's consideration, such as: aftermarket suppliers are a $100+ million industry; there are thousands of employees in the aftermarket supply industry; these employees and businesses provide tax revenue and support local communities; and the new regulation will put a massive financial and resource burden on aftermarket rail and marine engine suppliers. The commenter noted that there has not been any feedback requested from any CARMES member company, and the commenter does not believe

that it has had sufficient time for CARMES companies to study this issue. The commenter stated that it believes that the proposed regulations were influenced by OEM manufacturers who have lobbied for a one-sided regulatory environment. The commenter further stated that it believes that if the rule is implemented as proposed, competition in the market will be lessened substantially without offsetting economic or environmental benefit. CARMES commented that a solution is needed to preserve and encourage competition, and that as proposed, aftermarket suppliers and end users will be severely damaged by the rule. The commenter suggested that there should be integration of ideas to protect the interests of all, including CARMES and its members. The commenter believes that, without the aftermarket suppliers, there will be an OEM monopoly and a huge increase in the cost of part replacements for end users.

UNIPAR, Inc. (a CARMES member that submitted comments with CARMES, OAR-2003-0190-0650, p. 4), National Maintenance & Repair, Inc., Chromium Corporation, and Kaydon Ring & Seal, Inc. (Kaydon) also submitted comments similar to those of CARMES. These commenters also shared details of their specific situations. In addition, Chromium Corporation proposed that EPA should delay implementation of the proposed rule to 2010 and requested that the regulations allow a simple process to qualify parts or assemblies for substitution into certificate kits, including the following concepts to prevent aftermarket suppliers from being regulated out-of-business by new proposed emission regulations:

- OEM's should take the primary responsibility for developing new engines and retrofit kits for existing engines that meet emission requirements. The OEMs should be the primary certificate holders.
- Aftermarket suppliers should be allowed to treat the emission requirements for parts similar to the way they treat other factors such as performance, life, reliability and cost.
- Each part or assembly should be evaluated individually as to the extent that it may affect emission performance of each of the regulated pollutants.
- It should allow the demonstration that a part or assembly does not affect emission performance (example: head sealing gasket in a power assembly) or that a part or assembly is physically and functionally identical to the kit part or assembly and is, therefore, equivalent and cannot adversely affect emission performance. These parts or assemblies should receive a Certificate of Part Equivalence from EPA. These aftermarket parts or assemblies can then be substituted into any kit without threat of the primary certificate holder denying responsibility for the remaining kit components.
- If a part or assembly is different than the kit part or assembly, it may be necessary to demonstrate emission performance of the affected regulated pollutants through appropriate, but simplified, cost effective testing. Once the test results establish acceptable emission performance (equivalence or better) of the aftermarket part or assembly, and this data is presented to and accepted by EPA, the part or assembly will receive a Certificate of Part Equivalence, the part or assembly can then be substituted into any certificated kit without threat of the primary certificate holder denying responsibility for the remaining kit components.
- Any failure of emission testing must be evaluated to determine cause and the responsible party shall assume responsibility for remedying the problem.
- OEM and other certificate holders should not be permitted to discourage the substitution of any aftermarket part or assembly as long as with it has a Certificate of Part

Equivalence.

Letters:
Chromium Corporation OAR-2003-0190-0651
Coalition of Aftermarket Rail and Marine Engine Suppliers (CARMES) OAR-2003-0190-0650
Kaydon Ring & Seal, Inc. (Kaydon) OAR-2003-0190-0654
National Maintenance & Repair, Inc. OAR-2003-0190-0655

Our Response:

We have met several times with representatives of aftermarket companies since the proposal. We recognize the concerns raised by these small companies, and have revised our regulations to minimize any disruption. Specifically, the revised regulations include the following new provisions:

- We limit the total number of remanufactures that can be included under the pull-ahead provisions in 2008 and 2009 to 50-70 percent of the total number of remanufactures that occur during this period.

- We have included a component verification program in §1033.645. (See section 4.2.5, above.)

- We have added language to §1033.130 to limit the extent to which certificate holders may restrict the source of components for remanufacturing.

- We allow certifiers to use assigned deterioration factors during the pull-ahead period to shorten development time for competing remanufacture systems.

While we cannot guarantee that these provisions will prevent any change to the existing market, recent discussions with aftermarket companies indicate that these changes greatly reduce their concerns. Moreover, we believe the railroads have a strong interest in maintaining an active aftermarket for replacement parts as well as independent installers and sources of certificates.

4.10.4 Liability for Catalyst Manufacturers

What Commenters Said:

GE stated that catalyst manufacturers clearly could be categorized as a manufacturer within the meaning of the rule; and that, even though they may not hold certificates, their role in supplying perhaps the most critical emissions-related part of the locomotive indicates that they should bear as much or more liability than aftermarket parts suppliers that were the focus of the EPA determinations regarding liability in 1998. The commenter stated that it believes that catalyst manufacturers should bear the liability and recall burdens associated with the part of the locomotive control system that they supply, and that they can also be subject to warranty requirements under the rules because they can be classified as manufacturers. It also commented that it believes EPA should provide for a limited affirmative defense for owners/operators and locomotive manufacturers in the event of a catalyst failure to ensure that there are appropriate incentives for EPA to hold the catalyst makers liable for their failures. The commenter noted that EPA frequently provides affirmative defenses in Clean Air Act regulations to address the limitations of technology. GE suggested that, given EPA's proposal that the catalytic technology will not degrade more than 10% over the useful life, any further degradation should be the responsibility of the catalyst manufacturer and operators/manufacturers of the locomotive should be able to treat such an event as a malfunction-like occurrence.

Letters:
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

The definition "manufacturer" in the Clean Air Act includes any person engaged in the manufacturing or assembling of new nonroad vehicles or new nonroad engines. As we described in section 4.2.5, we agree with GE's comment that all entities meeting that definition, including entities that are not certificate-holders, can have liability under the regulations. Both the Part 92 and Part 1033 regulations specify that a manufacturer of emission-related components can be considered to be a "manufacturer" for remanufactured locomotives under the Clean Air Act's definition. This was based on fact that it can generally be assumed for most remanufactured locomotives that there is no single "remanufacturer". However, we cannot conclude that catalyst manufacturers are categorically "manufacturers" for freshly manufactured locomotives under the Act's definition, but would consider the factual circumstances applicable to the specific case. In many cases, there is a single manufacturer that has near total control over the process. Therefore, we will not be providing an affirmative defense as requested by commenters.

4.10.5 High Horsepower Locomotives

What Commenters Said:

GE commented that it believes the rule should take into account the possibility of higher horsepower locomotives and include procedures for determining appropriate alternative emission limits. The commenter stated that higher horsepower locomotives would necessitate the specification of a different, alternate standard, a suggestion that is consistent with the methodology proposed for the marine rule. The commenter noted that limitations in size and weight in locomotives may dictate the degree to which the proposed technologies can control emissions in larger engines compared to current (~4500 HP) engines. The commenter suggested that the certification process for a larger engine should require an application to EPA justifying a proposed alternate certified emissions level to the standards applicable to today's locomotives. GE commented that, to ensure that an additional rulemaking would not be required to introduce a higher horsepower locomotive, it requests a provision specifically addressing the certification process of higher horsepower engines in the rule.

Letters:
General Electric Transportation (GE)OAR-2003-0190-0590.1

Our Response:

We do not believe that it would be appropriate to establish less stringent standards for locomotives that are not currently being marketed in the U.S. Moreover, we believe that the emission credit program is intended to address such special circumstances.

4.10.6 Head-End Power

What Commenters Said:

Caterpillar noted that some locomotives are equipped with a separate head end power engine for hotel load. The commenter requested that the final rule include an option for including the head end power unit in total locomotive power for determining emissions compliance, to apply to both the power for switcher definition and the cycle emissions calculations. The commenter stated, however, that it believes that the current provision of allowing the head end power unit to be a non-road certified engine without inclusion in the locomotive cycle emissions should be retained.

MotivePower, Inc requested that EPA add language to the regulation clarifying that dedicated head end power (HEP) units, common on passenger locomotives, are certified under 40 CFR, Part 89 and are not regulated under Part 1033 as auxiliary power units.

Letters:
Caterpillar Inc. (Caterpillar) OAR-2003-0190-0485, 0498, 0580.1, 0591.1
MotivePower, Inc. OAR-2003-0190-0613

Our Response:

As noted in section 4.4 above, we will allow head-end power to be considered in determining whether a locomotive is a switch locomotive. However, we do not believe we should allow the power from separate head-end engines to be included in emission calculations. MotivePower was correct to note that those engines are regulated under Part 89 (and will be regulated under Part 1039 in the future). We continue to believe that that is the correct policy. Caterpillar's request included no basis for concluding otherwise.

4.10.7 Definition of Owners Manual

What Commenters Said:

With regard to §1033.120(e), requiring that the emissions warranty statement be included in the locomotive owner's manual, EMD commented that locomotives generally do not have an owner's manual, in the sense that an automobile is furnished with such a manual that is delivered in the glove compartment. The commenter noted that it is usual in the locomotive industry to include the warranty statement in the sales contract for the locomotive; and the commenter urged EPA to continue to allow that means. The commenter further noted that it will provide a copy of its standard warranty statement, which includes both the commercial warranty and the emissions warranty, to EPA upon request.

Letters:
Electro-Motive Diesel, Inc. (EMD) OAR-2003-0190-0502, 0594.1, 0662

Our Response:

Section 1033.901 defines "owners manual" to mean any written or electronic collection of instructions provided to ultimate purchasers to describe the basic operation of the locomotive.

4.10.8 EPA Access to Onboard Computer Information

What Commenters Said:

EMA stated that engine manufacturers object to the requirements of §§1042.110(b) and 1042.115(c) that would provide EPA access to proprietary engine information—the commenter suggested that these paragraphs be deleted.

Letters:
Engine Manufacturers Association (EMA) OAR-2003-0190-0575.1

Our Response:

Section 208 of the Clean Air Act clearly authorizes EPA to require a manufacturer to provide information we may reasonably require to determine whether the manufacturer is acting in compliance with the regulations. Since EMA did not dispute that such data may be needed to determine if they are in compliance, there is no basis for dropping these provisions. EPA has on many occasions been provided with proprietary information and has special procedures for dealing with such information.