ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 85, 89 and 92

[FRL–5686–1]

RIN 2060–AD33

Emission Standards for Locomotives and Locomotive Engines

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Proposed Rulemaking (NPRM).

SUMMARY: EPA is proposing regulatory requirements for the control of emissions from locomotives and engines used in locomotives as required by Clean Air Act section 213(a)(5). The primary focus of this proposal is reduction of the emissions of oxides of nitrogen (NO_X). The proposed standards will result in more than a 60 percent reduction in NO_X from freshly manufactured locomotives beginning in 2005, with lesser reductions from locomotives originally manufactured from 1973 through 2004. NO_X is a precursor to the formation of ground level ozone, which causes health problems such as damage to lung tissue, reduction of lung function, and sensitization of lungs to other irritants, as well as damage to terrestrial and aquatic ecosystems. EPA is also proposing standards for emissions of hydrocarbons (HC), carbon monoxide (CO), particulate matter (PM), and smoke. The cost effectiveness of today's proposed emissions standards is 173 dollars per ton of NO_X and PM reduced.

Three separate sets of standards are proposed, with applicability of the standards dependent on the date a locomotive is first manufactured. The first set of standards (Tier 0) are proposed to apply to locomotives and locomotive engines originally manufactured from 1973 through 1999, any time they are remanufactured in calendar year 2000 or later. The second set of standards (Tier I) apply to locomotives and locomotive engines originally manufactured from 2000 through 2004. Such locomotives and locomotive engines would be required to meet the Tier I standards at the time of original manufacture and at each subsequent remanufacture. The final set of standards (Tier II) are proposed to apply to locomotives and locomotive engines originally manufactured in 2005 and later. Such locomotives and locomotive engines would be required to meet the Tier II standards at the time of original manufacture and at each subsequent remanufacture.

Today's proposal includes a variety of provisions to implement the standards and to ensure that the standards are met in-use. These provisions include certification test procedures, and assembly line and in-use compliance testing programs. Also included in today's proposal is an emissions averaging, banking and trading program to provide flexibility in achieving compliance with the proposed standards. Finally, EPA is proposing regulations that would preempt certain state and local requirements relating to the control of emissions from new locomotives and new locomotive engines, pursuant to Clean Air Act section 209(e).

DATES: Comments must be received on or before April 14, 1997. A public hearing will be held on March 13, 1997, starting at 9:30 a.m. Persons wishing to present oral testimony are requested to notify EPA on or before March 6, 1997, to allow for an orderly scheduling of oral testimony.

ADDRESSES:

Written comments: Interested parties may submit written comments (in triplicate if possible) for EPA consideration. The comments are to be addressed to: EPA Air and Radiation Docket, Attention: Docket No. A–94–31, Room M–1500, Mail Code 6102, U.S. EPA, 401 M Street, S.W., Washington DC 20460. The docket is open for public inspection from 8 a.m. until 5:30 p.m. Monday through Friday, except on government holidays. As provided in 40 CFR part 2, a reasonable fee may be charged for copying docket materials. Should a commenter wish to provide confidential business information (CBI) to EPA, such CBI should NOT be included with the information sent to the docket. Materials sent to the docket should, however, indicate that CBI was provided to EPA. One copy of CBI, along with the remainder of the written comments, should be sent to Charles Moulis at the address provided in **FOR FURTHER INFORMATION CONTACT** below.

Public hearing: The public hearing will be held at: (Holiday Inn—North Campus, 3600 Plymouth Rd, Ann Arbor, MI 48105, (313) 769–9800).

FOR FURTHER INFORMATION CONTACT: For information on this rulemaking contact: Charles Moulis, U.S. EPA, Engine Programs and Compliance Division, 2565 Plymouth Road, Ann Arbor, MI 48105; Telephone: (313) 741–7826, Fax: (313) 741–7816. Requests for hard copies of the preamble, regulation text and regulatory support document (RSD) should be directed to Carol Connell at (313) 668–4349.

SUPPLEMENTARY INFORMATION:

I. Regulated Entities

Entities potentially regulated by this proposed action are those which manufacture and/or remanufacture locomotives and locomotive engines; those which own and operate railroads; and state and local governments. Regulated categories and entities include:

Category	Examples of regulated entities
Industry	Manufacturers and remanufacturers of locomotives and locomotive engines, railroad owners and operators.
Government	State and local governments.[1]

[1] It should be noted that the proposed provisions do not impose any requirements that state and local governments (other than those that own or operate local and regional railroads) must meet, but rather implement the Clean Air Act preemption provisions for locomotives. It should also be noted that some state and local governments also own or operate local and regional railroads.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this proposal. This table lists the types of entities that EPA is now aware could potentially be regulated by this proposal. Other types of entities not listed in the table could also be regulated. To determine whether your company is regulated by this proposal, you should carefully examine the applicability criteria in §§ 92.001 and 92.901 of the proposed regulatory text. If you have questions regarding the applicability of this proposal to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

II. Statutory Authority

Authority for the actions proposed in this notice is granted to the Environmental Protection Agency (EPA) by sections 114, 203, 204, 205, 206, 207, 208, 209, 213, 215, 216 and 301(a) of the Clean Air Act as amended in 1990 (CAA or ''the Act'') (42 U.S.C. 7414, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550 and 7601(a)).

EPA is proposing emissions standards for new locomotives and new engines used in locomotives pursuant to its authority under section 213 of the Clean Air Act. Section 213(a)(5) directs EPA to adopt emissions standards for new locomotives and new engines used in locomotives that achieve the greatest degree of emissions reductions achievable through the use of technology that the Administrator determines will be available for such vehicles and engines, taking into account the cost of applying such technology within the available time period, and noise, energy, and safety factors associated with the application of such technology. As described in this notice and in the regulatory support document, EPA has evaluated the available information to determine the technology that will be available for locomotives and engines proposed to be subject to EPA standards.

EPA is also acting under its authority to implement and enforce the locomotive emission standards. Section 213(d) provides that the standards EPA adopts for new locomotives and new engines used in locomotives ''shall be subject to sections 206, 207, 208, and 209'' of the Clean Air Act, with such modifications that the Administrator deems appropriate to the regulations implementing these sections.[1] In addition, the locomotive standards ''shall be enforced in the same manner as [motor vehicle] standards prescribed under section 202'' of the Act. Section 213(d) also grants EPA authority to promulgate or revise regulations as necessary to determine compliance with, and enforce, standards adopted under section 213. Pursuant to this authority, EPA is proposing that manufacturers (including remanufacturers) of new locomotives and new engines used in locomotives must obtain a certificate of compliance with EPA's emissions standards and requirements, and must subject the locomotives and engines to assembly line and in-use testing. The language of section 213(d) directs EPA to generally enforce the locomotive emissions standards in the same manner as it enforces motor vehicle emissions standards. Pursuant to this authority, EPA is proposing regulations similar to those adopted for motor vehicles and engines under section 203 of the Act, which prescribes certain enforcement-related prohibitions, including a prohibition against introducing a new vehicle or engine that is not covered by a valid certificate of conformity into commerce, a prohibition against tampering, and a prohibition on importing a vehicle or engine into the United States without a valid, applicable certificate of conformity. In addition, EPA is proposing emission defect regulations that require manufacturers to report to EPA emissions-related defects that affect a given class or category of engines.

EPA is also proposing regulations to clarify the scope of preemption of state regulation. Section 209(e) prohibits states from adopting and enforcing standards and other requirements relating to the control of emissions from new locomotives and new engines used in locomotives. This provision also grants EPA authority to adopt regulations to implement section 209(e). Pursuant to this authority, EPA is proposing to adopt regulations to implement the express preemption of state emissions standards for new locomotives and new engines used in locomotives, for the purpose of clarifying the scope of preemption for states and industry.

III. Background

A. Locomotives

Locomotives generally fall into three broad categories based on their intended use. Switch locomotives, typically 1500 kilowatts (kW) or less, (2000 horsepower (hp)), are the least powerful locomotives, and are used in freight yards to assemble and disassemble trains, or for short hauls of small trains. Passenger locomotives are powered by engines of approximately 2200 kW (3000 hp), and may be equipped with an auxiliary engine to provide hotel power for the train, although they may also generate hotel power (i.e., electrical power used for lighting, heating, etc. in the passenger cars) with the main engine. Freight or line-haul locomotives are the most powerful locomotives and are used to power freight train operations over long distances. Older line-haul locomotives are typically powered by engines of approximately 2,200 kW (3,000 hp), while newer line-haul locomotives are powered by engines of approximately 3,000 kW (4,000 hp). In some cases, older line-haul locomotives (especially lower powered ones) are used in switch applications. The industry expects that the next generation of freshly manufactured line-haul locomotives will be powered by 4,500 kW (6,000 hp) engines.

One unique feature of locomotives that makes them different than other, currently regulated mobile sources is the way that power is transferred from the engine to the wheels. Most mobile sources utilize mechanical means (i.e., a transmission) to transfer energy from the engine to the wheels (or other site of use). This results in engine operation which is very transient in nature, with respect to changes in both speed and load. In contrast, locomotive engines are typically connected to an electrical generator to convert the mechanical energy to electricity. This electricity is then used to power traction motors which turn the wheels. This lack of a direct, mechanical connection between the engine and the wheels allows the engine to operate in an essentially steady state mode in a number of discrete power settings, or notches. Current locomotives typically have eight power notches, as well as one or two idle settings.

A second unique feature of locomotives setting them apart from other mobile sources is their braking system. In this braking system, called the dynamic brake, the traction motors act as generators, with the generated power being dissipated as heat through an electric resistance grid. While the engine is not generating motive power (i.e., power to propel the locomotive, also known as tractive power) in the dynamic brake mode, it is generating power to operate the resistance grid cooling fans. As such, the engine is operating in a power mode that is different than the power notches or idle settings just discussed. While most diesel electric locomotives have dynamic brakes, some do not (generally switch locomotives).

B. Railroads

In the United States, freight railroads are subdivided into three classes by the Federal Surface Transportation Board (STB), based on annual revenue. In 1994 a railroad was classified as a Class I railroad if annual revenue was $255.9 million or greater, as a Class II railroad with annual revenue of between $20.5 and 255.8 million, and as a Class III railroad with revenues of under $20.5 million. In 1994, there were 12 Class I railroads and 519 Class II and III railroads operating in the U.S. Due to a recent merger of two railroads, there are currently 11 Class I railroads operating in the U.S. Class I railroads presently operate approximately 18,500 locomotives in the U.S., while Class II and III railroads operate approximately 2,650 locomotives.[2]

[1] Sections 206, 207, 208, and 209 of the Act cover compliance testing and certification, in-use compliance, information collection, and state standards, respectively.

[2] Railroad Facts, 1995 Edition, Association of American Railroads, September, 1995.

C. Locomotive Usage

Movement of freight by Class I railroads totaled approximately 910 billion ton-miles in 1981, increasing to approximately 1,201 billion ton-miles in 1994; an increase of approximately 32 percent. At present, more than ⅓ of total intercity revenue freight ton-miles moved in the U.S. by all transportation means are moved by train.[3]

D. Locomotive Sales and Rebuild Practices

From 1985 through 1994, annual sales of freshly manufactured locomotives fluctuated somewhat, but averaged approximately 450 units. Class I railroads typically purchase all of these freshly manufactured locomotives. Older locomotives owned by Class I railroads are either sold to smaller railroads, scrapped, or purchased by an independent entity for remanufacture and resale. The total life of a locomotive is approximately 40 years, during which period the engine and the locomotive undergo several extensive remanufacturing operations. These remanufacturing operations generally consist of, at a minimum, the replacement of the power assemblies (*i.e.*, pistons, piston rings, cylinder liners, cylinder heads, fuel injectors, valves, etc.) with new components (or components that are in new condition) to bring the locomotive back to the condition it was in when originally manufactured with respect to performance, durability and emissions.

E. Locomotive and Locomotive Engine Manufacturers and Remanufacturers

Locomotives used in the United States are primarily produced by two manufacturers: the Electromotive Division of General Motors (EMD) and General Electric Transportation Systems (GE). These manufacturers produce both the locomotive chassis and the propulsion engines, and also remanufacture engines. MotivePower Industries (formerly MK Rail Corporation) recently entered the market and has manufactured some locomotives using engines manufactured by Caterpillar, Inc. Detroit Diesel Corporation and Cummins Engine Company, Inc. also produce engines which may be used in locomotives. U.S. railroads do not tend to purchase locomotives or locomotive engines from manufacturers outside of the U.S.

The two primary manufacturers of freshly manufactured locomotives also provide remanufacturing services to their customers. Several additional entities also remanufacture locomotives. Many Class I railroads remanufacture locomotive engines for their own units and on a contract basis for other railroads. Additionally, there are a small number of independent remanufacturing operations in existence.

F. Interstate Commerce

Current railroad networks (rail lines) are geographically widespread across the United States, serving every major city in the country. Today, approximately one-third of the freight hauled in the United States is hauled by train. There are very few industries or citizens in the U.S. who are not ultimate consumers of the services provided by the American railroad companies. Efficient train transportation is a vital factor in the strength of the U.S. economy.

Class I railroads operate regionally. This is why railroad companies and the Federal Railroad Administration (FRA), have stressed the importance of unhindered rail access across all state boundaries. If states regulated locomotives differently, a railroad could conceivably be forced to change locomotives at state boundaries, and/or have state-specific locomotive fleets. Currently, facilities for such changes do not exist, and even if switching areas were available at state boundaries, it would be a costly and time consuming disruption of interstate commerce. Any disruption in the efficient interstate movement of trains throughout the U.S. would have an impact on the health and well-being of not only the rail industry but the entire U.S. economy as well.

G. Modal Shift

Another important point requiring consideration in the regulation of locomotives is the potential for modal shift. A modal shift is a change from one form of transportation, such as trains, to another form, such as trucks. Modal shift can have negative or positive effects on national and local emissions inventories. Negative modal shift occurs when there is a shift to a more polluting form of transportation.

Information currently available to EPA shows that truck-based freight movement generates more pollutants per ton-mile of freight hauled than current, unregulated rail-based forms of freight movement. Estimates quantifying the difference indicate that locomotives are on the order of three times cleaner than trucks on an emissions per ton-mile basis.[4] Thus, overly stringent regulation of the rail industry or a disruption in interstate rail movement could cause rail prices to increase and thus cause a negative modal shift. Regulations that were overly stringent could raise equipment and/or operating costs to the point that it might be a wiser economic choice to move current rail freight by truck. Additionally, delays caused by changing locomotives at state boundaries due to separate state locomotive regulations could be costly to railroad companies. These increased costs would be reflected in the price of hauling freight by rail and may even eliminate some rail carriers from the market. In both of these cases customers could switch to trucks for the movement of their freight. Any freight normally carried by rail that is hauled by trucks instead of by rail would increase overall emissions, even at current emissions levels.

H. Health and Environmental Impacts of Ambient NO_X and PM

Oxides of nitrogen (NO_X) are a family of reactive gaseous compounds that contribute to air pollution in both urban and rural environments. NO_X emissions are produced during the combustion of fuels at high temperatures. The primary sources of atmospheric NO_X include highway sources (such as light-duty and heavy-duty vehicles), nonroad sources (such as construction and agricultural equipment, and locomotives) and stationary sources (such as power plants and industrial boilers). Ambient levels of NO_X can be directly harmful to human health and the environment. More importantly, from an overall health and welfare perspective, NO_X contributes to the production of secondary chemical products that in turn cause additional health and welfare effects. Prominent among these are ozone and nitrate particulate.

The component of NO_X that is of most concern from a health standpoint is nitrogen dioxide, NO_2. EPA has set a primary (health-related) NAAQS for NO_2 of 100 micrograms per cubic meter, or 0.053 parts per million. Direct exposure to NO_2 can reduce breathing efficiency and increase lung and airway irritation in healthy people, as well as in the elderly and in people with pre-existing pulmonary conditions. Exposure to NO_2 at or near the level of the ambient standard appears to increase symptoms of respiratory illness, lung congestion, wheeze, and

[3] *Id.* A revenue freight ton-mile is the commercial movement (*i.e.*, for revenue) of one ton of freight one mile.

[4] Note from F. Peter Hutchins to Joanne I. Goldhand, dated 2/14/94, and entitled ''Estimate of Relative NO_X Emissions Resulting from Movement of Freight by Truck and by Train.''

increased bronchitis in children. In addition to the direct effects of NO_X, the chemical transformation products of NO_X also contribute to adverse health and environmental impacts. These secondary impacts of NO_X include ground-level ozone, nitrate particulate matter, acid deposition, eutrophication (plant overgrowth) of coastal waters, and transformation of other pollutants into more dangerous chemical forms.

Ozone is a highly reactive chemical compound that can affect both biological tissues and man-made materials. Ozone exposure causes a range of human pulmonary and respiratory health effects. While ozone's effects on the pulmonary function of sensitive individuals or populations (*e.g.,* asthmatics) are of primary concern, evidence indicates that high ambient levels of ozone can cause respiratory symptoms in healthy adults and children as well. For example, exposure to ozone for several hours at moderate concentrations, especially during outdoor work and exercise, has been found to decrease lung function, increase airway inflammation, increase sensitivity to other irritants, and impair lung defenses against infections in otherwise healthy adults and children. Other symptoms include chest pain, coughing, and shortness of breath.

In recent years, significant efforts have been made on both a national and state level to reduce air quality problems associated with ground-level ozone, with a focus on its main precursors, oxides of nitrogen (NO_X) and volatile organic compounds (VOCs).[5] The precursors to ozone and ozone itself are transported long distances under some commonly occurring meteorological conditions. Specifically, concentrations of ozone and its precursors in a region and the transport of ozone and precursor pollutants into, out of, and within a region are very significant factors in the accumulation of ozone in any given area. Regional-scale transport may occur within a state or across one or more state boundaries. Local source NO_X and VOC controls are key parts of the overall attainment strategy for nonattainment areas. However, the ability of an area to achieve ozone attainment and thereby reduce ozone-related health and environmental effects is often heavily influenced by the ozone and precursor emission levels of upwind areas. Thus, for many of these areas, EPA believes that attainment of the ozone NAAQS will require control programs much broader than strictly locally focused controls to take into account the effect of emissions and ozone far beyond the boundaries of any individual nonattainment area.

EPA therefore believes that effective ozone control requires an integrated strategy that combines cost-effective reductions in emissions from both mobile and stationary sources. EPA's current initiatives, including the national locomotive emissions standards proposed in this action, are components of the Agency's integrated ozone reduction strategy.

In addition to ozone, airborne particulate matter (PM) has been a major air quality concern in many regions. Ozone and PM have both been linked to a range of serious respiratory health problems and a variety of adverse environmental effects. As was previously discussed, ozone causes harmful respiratory effects including chest pain, coughing, and shortness of breath. Similarly, PM exposure is associated with health effects including shortness of breath, aggravation of existing respiratory disease, cancer, and premature death.

Beyond their effects on human health, other negative environmental effects are also associated with ozone, NO_X, and PM. Ozone has been shown to injure plants and materials; NO_X contributes to the secondary formation of PM (nitrates), acid deposition, and the overgrowth of algae in coastal estuaries. PM can damage materials and impair visibility. These effects are extensively discussed in EPA's ''air quality criteria'' documents for NO_X, ozone, and PM.[6][7][8] EPA recently proposed revisions to the national ambient air quality standards (NAAQS) for ozone and PM.[9]

IV. Emissions from Present Locomotives

A. National Inventories

Contributions by locomotives to the national emissions inventories for volatile organic compounds (VOC), carbon monoxide (CO), oxides of nitrogen (NO_X) and particulate matter (as PM–10) are summarized in Table IV–1. The values shown in Table IV–1 are the total national inventories from all sources, from mobile sources, and from locomotives for 1990. The railroad inventories, expressed as the percentage contributions by commercial railroads to the total national inventories and to the transportation sources inventories, are shown in Table IV–2. The Agency recognizes that not all of the locomotives in service are owned and operated by commercial (including public) railroads. The locomotives not operated by the commercial railroads are generally used to transport equipment and materials within an industrial facility. However, in light of the small percentage of in-use locomotives that are not operated by commercial railroads, EPA believes that the emissions from these locomotives are an extremely small percentage of the total emissions from all locomotives in service. Thus, for the purposes of this discussion it is assumed that locomotive and railroad emission inventories are equivalent.

TABLE IV–1[1].—1990 NATIONAL EMISSION INVENTORIES: ALL SOURCES, MOBILE SOURCES, AND LOCOMOTIVES

[millions of metric tons]

Emission	Total from all sources	Mobile sources	Locomotives
NO_X	20.90	9.37	0.98
PM–10	39.31	0.66	.024
VOC	21.41	8.14	.038

[5] VOCs consist mostly of hydrocarbons (HC).

[6] Air Quality Criteria Document for Oxides of Nitrogen, EPA–600/8–91/049aF–cF, August 1993 (NTIS #: PB92–17–6361/REB,– 6379/REB, –6387/REB).

[7] Air Quality Criteria Document for Ozone and Related Photochemical Oxidants (External Review Draft), EPA/600/P–93/004aF–cF, 1996.

[8] Air Quality Criteria for Particulate Matter (External Review Draft), EPA–600/AP–95/001a–a, April 1995.

[9] 61 FR 65638 (PM) and 61 FR 65716 (ozone), December 13, 1996.

TABLE IV–1[1].—1990 NATIONAL EMISSION INVENTORIES: ALL SOURCES, MOBILE SOURCES, AND LOCOMOTIVES—Continued

[millions of metric tons]

Emission	Total from all sources	Mobile sources	Locomotives
CO	91.31	70.31	.11

[1] Data for all pollutants from all sources and mobile sources is taken from ''National Air Pollutant Emission Trends, 1900–1994'', U.S. Environmental Protection Agency, EPA–454/R–95–011, October 1995. Locomotive pollutant estimates are derived from emission factors (contained in Table IV–3), along with fuel consumption data and a bhp–hr/gallon conversion factor. The trends report, based on older locomotive emission factors, reports locomotive PM–10 at 0.04 million metric tons. The trends report mobile source inventories were not updated to reflect the revised railroad inventories, but nonetheless provide an idea of the magnitude of locomotive emissions. The trends report mobile source inventory for VOC does not specify the emissions contribution of locomotives.

TABLE IV–2.—LOCOMOTIVE CONTRIBUTIONS TO NATIONAL INVENTORY IN 1990 AS A PERCENTAGE OF ALL SOURCES AND OF MOBILE SOURCES

Emission	Percent of all sources contributed by locomotives	Percent of mobile sources contributed by locomotives
NO_X	4.67	10.4
PM–10	0.061	3.65
VOC	.18	0.47
CO	.12	0.16

B. Locomotive Emission Rates

EPA received information from EMD, GE and the Association of American Railroads (AAR) regarding emissions of HC, CO, NO_X and PM from locomotives. This information is summarized in the Regulatory Support Document (RSD) for this rulemaking. Based on this information, EPA calculated estimates of average emissions rates for line-haul and switch locomotives. Table IV–3 shows estimated nationwide average emissions for each category, expressed in grams per brake horsepower-hour (g/bhp–hr). It should be noted that, although line-haul locomotives appear to be much cleaner than switch locomotives, this is merely an artifact of the fact that g/bhp–hr emission rates are much higher at low power modes, and switch locomotives operate in low power modes a greater percentage of time than do line-haul locomotives. A description of the methodology used by EPA in determining these emission rates is included in the RSD in the docket. EPA requests comment on these estimated emissions rates. Commenters are encouraged to include additional emissions data where possible.

TABLE IV–3.—CURRENT ESTIMATED LINE-HAUL AND SWITCH LOCOMOTIVE EMISSIONS RATES (G/BHP–HR)

	HC	CO	NO_X	PM	Smoke (percent opacity)
Line-hau	0.5	1.5	13.5	0.34	Equivalent to HDDE [1]
Switch	1.1	2.4	19.8	0.41	Equivalent to HDDE.

[1] Heavy-duty diesel motor vehicle engine.

V. Description of the Proposal

This section contains a description of today's proposed emissions control program for new locomotives and locomotive engines. The subjects discussed are applicability, emission standards, test procedures, certification and testing requirements, enforcement, railroad requirements, preemption, and other miscellaneous topics. This section also includes a discussion of the various options EPA considered in developing the proposal. The Agency requests comments on these other options, as well as on the actual proposal. The interested reader is referred to the proposed regulatory text and the RSD for a more detailed discussion of many of these issues.

A. Applicability

Section 213(a)(5) of the Act specifies that EPA shall establish emission standards for ''new locomotives and new engines used in locomotives.'' Thus, the general applicability of this action is determined by the definition of ''new locomotive'' and ''new locomotive engine''. The Act, however, does not define ''new locomotive'' or ''new locomotive engine,'' which gives the Agency some discretion in defining the category of locomotives and locomotives engines that should be considered ''new''. EPA proposes to define ''new locomotive'' and ''new locomotive engine'' to mean a locomotive or locomotive engine the equitable or legal title to which has never been transferred to an ultimate purchaser; and a locomotive or locomotive engine that has been remanufactured, until it is placed back into service. Where the equitable or legal title to a locomotive or locomotive engine is not transferred before the engine or vehicle is placed into service, then the locomotive or locomotive engine will be new until it is placed into service. EPA also proposes to define imported locomotives and locomotive engines to be new unless they are covered by a certificate of conformity at the time of importation. Finally, EPA proposes to limit the applicability of the definition of new locomotive and new locomotive engine to locomotives and locomotive engines originally manufactured after 1972. As is described in the RSD, the applicability would be limited in this manner to eliminate the unwarranted

burden of bringing very old locomotives into compliance.

EPA is aware of a practice in the locomotive industry known as upgrading. During an upgrade, a locomotive remanufacturer will typically take an older engine model and remanufacture it in such a manner that it is in essentially all respects a more recent model, both in terms of its performance and the expected remaining service life following the upgrade. EPA is proposing a definition of remanufacture that includes this process of upgrading. EPA proposes that any pre-1973 locomotives which are upgraded to post-1972 specifications be required to meet the same emissions standards as locomotives originally manufactured after 1972. Also, for the purposes of the various compliance programs discussed later (certification, production line testing, in-use testing), upgraders will be treated as remanufacturers.[10] The Agency requests comment on its definition of upgrade, as contained in the proposed regulatory text, and whether it should be written to optionally (the remanufacturer's option) include any remanufactured pre-1973 locomotive that complies with the Tier 0 emission standards.

The proposed definition of ''new locomotive'' and ''new locomotive engine'' would be consistent with, but not identical to, the definition of ''new nonroad engine'' and ''new nonroad vehicle'' that EPA promulgated on July 20, 1994 (59 FR 36969), and revised on October 4, 1996 (61 FR 52102). The definition of ''new nonroad engine'' includes only ''freshly manufactured'' engines, while the proposed definition of ''new locomotive'' and ''new locomotive engine'' includes both freshly manufactured and remanufactured locomotives and engines. EPA believes it is appropriate to regulate remanufactured locomotive engines as new engines because of the nature of the remanufacturing process for such engines. Remanufacturing locomotives typically involves inspecting the relevant components and replacing most or all of them as necessary with components that are functionally equivalent to freshly manufactured components. The relevant components include those that control the delivery of fuel to the combustion process, those that control the condition and delivery of air to the combustion process, and those that are directly involved in the combustion process, (at a minimum, the fuel injectors, turbocharger, charge air cooler, pistons and piston rings, cylinders, valves, valve springs, camshaft, and cylinder head). This process is a more complete overhaul than the typical rebuilding of an on-highway diesel engine. Since a remanufactured locomotive engine is in all material ways like a freshly manufactured engine, both mechanically and in terms of how it is used, EPA proposes to define ''new locomotive engine'' to include remanufactured engines. As with freshly manufactured locomotives, such engines would be new until sold or placed into service.

This approach is further supported by the role remanufactured engines play in the locomotive industry. Locomotive engines are typically remanufactured periodically, as many as ten times during their total service lifetimes, and may be used in different locomotives following a remanufacture. Many smaller railroad operators do not purchase freshly manufactured locomotives, relying solely on the purchase of used locomotives from other railroad operators and the subsequent remanufacturing of these engines. Because of these remanufacturing practices, a locomotive engine will generally be used for many years, resulting in an extremely slow industry-wide fleet turnover rate. As a result, a narrow definition of new locomotive engines, limited to freshly manufactured engines, would effectively undercut the ability of the Agency to reduce emissions contribution from this segment of the nonroad inventory. EPA notes that the practices related to the use of remanufactured locomotive engines distinguishes this situation from other kinds of rebuilding, such as for other nonroad engines, and motor vehicle engines, or aircraft engines. Even aircraft engines do not typically remain in active service for 40 years moreover, there are fewer events that could be considered remanufacturing as described here for locomotives, because, among other things, the maintenance practices in the airline industry typically are more continuous than in the railroad industry. In addition, because the engines have fundamentally different designs (jet engine as compared to diesel engine), the overhaul of our aircraft engine is not comparable to the remanufacturing of a diesel locomotive. EPA is requesting comments on the inclusion of remanufactured locomotives in the definition of ''new'' for this rulemaking.

The Agency is proposing to define ''remanufacture'' of a locomotive engine as a process in which all of the power assemblies of an engine are replaced (with freshly manufactured (containing no previously used parts) or refurbished power assemblies) or inspected and qualified. Inspecting and qualifying previously used parts can be done in several ways, including such things as cleaning, measuring physical dimensions for proper size and tolerance, and running performance tests to assure that the parts are functioning properly and according to specifications. The refurbished power assemblies would include some combination of freshly manufactured parts, reconditioned parts from other previously used power assemblies, and reconditioned parts from the power assemblies that were replaced. In cases where all of the ower assemblies are not replaced at a single time, the engine would be considered to be ''remanufactured'' (and therefore ''new'') if all of the power assemblies from the previously new engine had been replaced within a five year period. EPA requests comment on this definition in general, and specifically whether it should include some different time limit for engines not remanufactured during a single event. Commenters are requested to address both the legal, economic, and environmental implications of considering an engine which does not have all of its power assemblies replaced in a single event to be ''new''.

EPA is proposing to include in its definition of ''remanufacture'' the conversion of a locomotive or locomotive engine to operate on a fuel other than the fuel it was originally designed and manufactured to operate on. Such conversions typically involve, at a minimum, the replacement or modification of the fuel delivery system, and often involve the replacement or modification of other emissions-critical components, as well as the recalibration of some engine operating parameters. For these reasons EPA is proposing to include alternative fuel conversions in its definition of remanufacture. Such conversions would thus be considered ''new'' and subject to today's proposed regulations.

EPA also requests comment on possible alternative definitions of these terms, including two suggested alternatives raised by the affected industries. Railroad operators and locomotive manufacturers have indicated to EPA that it should consider a definition of ''new'' that would include any locomotive or locomotive engine manufactured or remanufactured after the effective date of the 1990 amendments to the Clean Air Act

[10] Unless specified otherwise, all provisions discussed in this preamble applicable to remanufacturers shall also be considered to be applicable to upgraders.

(November 15, 1990). Under this alternative approach, EPA would define as ''new'' any locomotive or engine that is first manufactured after November 15, 1990, and any locomotive or engine, including those manufactured before November 15, 1990, that is remanufactured after that date. Since a locomotive would be new based solely on when it was manufactured or remanufactured, once it is new it would continue as new from then on. It would always be a new locomotive.

EPA also solicits comment on a second alternative definition of ''new'' for locomotives and locomotive engines, a variation of the first alternative. Locomotives and engines would be categorized as new from the time of first manufacture, or upon remanufacture, but only for the full extent of their useful life as defined by EPA regulations, and as long thereafter as they were shown to be in compliance with the applicable federal emissions standards and requirements.

EPA invites comment on these two alternatives, including the expected emissions impacts, the impacts on states, and whether the Agency would have the discretion under the Act to adopt such alternatives. On the last issue, EPA specifically invites comment on whether it has the authority and whether it would be appropriate to adopt a definition of new for locomotive and locomotive engine that differs so significantly from the definition of ''new'' adopted for all other nonroad vehicles and engines, and the Act's definition of new motor vehicle and new motor vehicle engine under section 216.

B. Emission Standards

As is described in the following sections, EPA is proposing three different sets of locomotive emissions standards, with the applicability of each dependent on the date a locomotive is first manufactured (i.e., 1973–1999, 2000–2004, or 2005 and later). Every locomotive covered by this proposal would be required to meet emission standards when operated over duty-cycles EPA believes are representative of average line-haul and switch operation. Also, any covered locomotive would be required to meet the standards over its full useful life, as defined by EPA regulations. The following sections discuss the proposed standards in detail, as well as presenting the other options EPA considered in their development.

B.1. Duty-Cycles

A duty-cycle describes a usage pattern for any class of equipment, using the percent of time at defined loads, speeds or other readily identifiable and measurable parameters. EPA's emission standards for mobile sources are typically numerical standards for emissions performance measured during a test procedure that embodies a specific duty-cycle for that kind of equipment. For example, the federal test procedure for passenger cars and light trucks is a procedure that specifies, second by second, the speed of the test vehicle, with simultaneous loading on the engine equivalent to loading which occurs on the road. Since the emissions of a particular type of equipment are dependent upon the way the equipment is operated, the duty-cycle used for emission testing directly affects the kind of design changes required to meet the standards. In this notice, the Agency is proposing a series of steady-state test modes, with the duty-cycles being used to weight the different test modes, resulting in an average emission rate for the duty-cycles. A brief overview of the duty-cycles EPA proposes to use for certification and compliance will be presented here, rather than in the test procedures section.

The Agency used a variety of available information to arrive at the proposed duty-cycles for locomotive testing, including several duty-cycles historically used by railroads and locomotive manufacturers to assess fuel and equipment usage. These duty-cycles were evaluated by EPA in light of actual in-use data on recent locomotive operations. Based on this analysis, EPA developed separate duty-cycles for line-haul, passenger and switch locomotives that account for the fundamentally different types of service these three categories of locomotives experience in use. These duty-cycles are presented in Table V–1. Since these duty-cycles merely represent the percent of time locomotives typically spend in each throttle notch and are not used during actual emissions testing, they are termed throttle notch weighting factors for the purposes of this proposal. A complete discussion of the historical cycles, in-use data, EPA's analysis of the relevant information, and development of these weighting factors is contained in the RSD.

TABLE V–1.—PROPOSED THROTTLE NOTCH WEIGHTING FACTORS FOR LOCOMOTIVES AND LOCOMOTIVE ENGINES

[Percent weighting per notch]

Throttle notch	Line-haul	Passenger	Switch
Idle	38.0	47.4	59.8
Dynamic Brake	12.5	6.2	0.0
1	6.5	7.0	12.4
2	6.5	5.1	12.3
3	5.2	5.7	5.8
4	4.4	4.7	3.6
5	3.8	4.0	3.6
6	3.9	2.9	1.5
7	3.0	1.4	0.2
8	16.2	15.6	0.8

B.2. Emission Standards

Tables V–2 through V–6 contain the emissions standards EPA is proposing to adopt for locomotives and locomotive engines. Standards are proposed for three categories of locomotives based on date of original manufacture (i.e., the Tier 0, Tier I and Tier II standards). The date of original manufacture is an appropriate factor to use in categorizing locomotives for emissions control purposes because it affects the emission reduction technologies that can either be retrofitted (for remanufacturing of existing locomotives) or are projected to be available in 2000 or 2005 for freshly manufactured locomotives.

EPA requests comments on the appropriateness of the levels of the standards, including the Tier II standards for NO_X and PM. The proposed Tier II standards would require more than a 60 percent reduction in NO_X and a 50 percent reduction on PM from uncontrolled levels. However, given the fact that locomotives contribute a substantial portion of the national NO_X inventory while their contribution to the PM inventory is much less substantial, EPA requests comment on whether it should set Tier II emissions standards that are more stringent for NO_X than the levels noted above and less stringent for PM. For example, EPA requests comment on Tier II standards which would achieve a 70 to 75 percent reduction in NO_X but smaller (*e.g.*, 30 percent, rather than the 50 percent reduction of the proposed Tier II PM standards) or even no reductions in PM compared to uncontrolled levels. EPA believes that, given the inherent tradeoff between NO_X and PM emissions control in diesel engines, such a tradeoff of NO_X and PM reductions in this option compared to the proposed Tier II standards may not change costs substantially compared to

the proposed Tier II standards, but may require a somewhat different technology mix. An analysis of the cost and technology implications of this option are contained in the public docket. EPA requests comment on all aspects of this option, including its technology and cost implications. EPA also requests comment on the cost and technology implications of requiring additional NO_X reductions, including the implications for control of PM. Finally, EPA requests comment on whether it should consider more stringent Tier II PM standards than those proposed, and what the implications of such standards might be for NO_X control, as well as their cost and technology implications.

Should the Agency consider tightening the particulate standards for Tier 0 and Tier I locomotives to ensure that particulate emissions do not exceed the current baseline level (0.34 g/bhp-hr for line-haul locomotives); and would more stringent particulate standards require relaxation of the NO_X standards? For example, EPA could set the particulate standard for Tier 0 locomotives at 0.40 g/bhp-hr to effectively prevent any Tier 0 locomotives from emitting above the current baseline; and set the particulate standard for Tier I locomotives at 0.3 g/bhp-hr to achieve a 25 percent reduction in emissions from the current baseline level. If the Agency were to adopt more stringent particulate standards for Tier 0 locomotives should they be phased-in to provide more leadtime to remanufacturers? The Agency requests comment on whether it should consider giving some form of credit for locomotives that are designed to shut down at idle, given that such locomotives would not be generating idle emissions in use, but would have idle emissions measured during emissions testing. Finally, the Agency requests comment on the stringency and form of the smoke standards.

Auxiliary engines used only to provide hotel power for the passenger cars of a train are currently subject to the applicable emissions standards previously adopted for nonroad compression ignition (CI) engines over 37 kW [11]. These standards, shown in Table V–6, will apply regardless of which of the duty-cycle options discussed is adopted.

In addition to proposing separate emissions standards for the three categories of locomotives based on date of original manufacture, the Agency considered three options for separate emissions standards for each of the three distinct types of locomotive operation described above (switch, passenger and line-haul). Of the three options considered, EPA is proposing the ''dual-cycle'' option, where all locomotives, regardless of their intended usage, would be required to meet both switch and line-haul duty-cycle standards. Details of this option, as well as the other two duty-cycle based options EPA considered (*i.e.*, the ''class-specific'' and the ''single-cycle'' options) are discussed in the following paragraphs.

The standards being proposed are designed to achieve very significant reductions in NO_X emissions from the beginning of the program, while significant reductions in the emissions of other pollutants would only be achieved under the Tier II standards, effective in 2005. This is because NO_X is the only pollutant for which locomotive emissions contribute more than one percent of the estimated national inventories (see Table IV–2). EPA believes that the Tier 0 and Tier I emission standards for NO_X might not be achievable if significant reductions in HC, CO, and PM were also required. Thus, the standards being proposed are intended to achieve the greatest environmental benefits as early as possible.

Class-Specific Option

Given the three distinct types of locomotive operation discussed above (*i.e.*, switch, passenger and line-haul), the first option the Agency considered was separate emission standards and duty-cycle weightings for each type (*i.e.*, the class specific option). Separate duty-cycle standards were intended to address the wide disparity in usage patterns for the different groups, and the effect of such use on emissions.

Although duty-cycles were developed for average locomotive operation, wide variations in actual operations do occur within the three basic types of operation (*i.e.*, switch, passenger and line-haul). To prevent substantial disparity between the in-use emissions rate and the emissions rate during the test cycle, EPA considered notch-by-notch emissions standards for all notches (*i.e.*, notch caps) for all pollutants. It should be noted that if a locomotive were operating at the levels of the notch caps for all notches, its duty-cycle-weighted emissions would be much higher than the duty-cycle standards. Thus, the proposed duty-cycle standards would prevent any locomotive from emitting at levels of the notch caps for all (or even most) notches. These notch-by-notch values were chosen to allow manufacturers and remanufacturers some degree of flexibility in meeting the duty-cycle standards, while at the same time insuring that differences in the utilization of locomotives which normally occur will not cause significant divergence from the duty-cycle emission standard. To provide additional flexibility to manufacturers and remanufacturers, EPA also considered a provision allowing a limited number of notch standards to be exceeded by a specified small amount provided there is compliance with the duty-cycle standards. The duty-cycle-weighted emissions standards and NO_X and PM notch caps considered under this option are shown in Tables V–2 through V–5 for line-haul, switch and passenger locomotives equipped with a single engine. Notch caps for HC and CO which are 25 percent above the applicable line-haul duty-cycle standards were also considered under this option.

Dual Cycle Option

The manufacturers indicated to EPA that it would be burdensome to comply with three sets of emission standards when essentially the same engine (differing only, for example, in the number of cylinders) could be used for all three types of locomotives (switch, passenger and line-haul). The manufacturers' concern is not based on testing burden since, as discussed in the test procedures section, the same test results on a notch-by-notch basis are simply weighted differently to determine compliance with the different standards. Rather, the issue is one of having to design three different versions of a single engine to meet three different sets of emission standards.

The Agency believes that the line-haul/switch dual cycle approach has some merit due to its ability to control idle emissions from switch locomotives as well as high notch emissions from line-haul and passenger locomotives. However, EPA is concerned that the lack of notch caps creates a situation where, with the use of electronic controls, the duty-cycle standards can be met during testing according to the proposed test procedure, but in-use emissions reductions are not fully realized. One way that this could happen would be if the average in-use duty-cycle changed to include greater percentages of time in notches which have disproportionately high emissions. Notch caps in individual modes would reduce this concern since it would require emissions control in all notches. A locomotive could also be designed such that the emissions during operation at notch eight (which are heavily weighted in the line-haul duty-

[11] 59 FR 31335, June 17, 1994, and 40 CFR part 89.

cycle) are low, while notch seven is calibrated for low fuel consumption (and possibly high emissions, due to the inherent tradeoffs between performance, fuel economy and emissions control) but at a power level near the notch eight power level. A locomotive operator could then use notch seven where notch eight would normally be employed, resulting in a savings in fuel consumed, and minimal impact in train schedules, at the expense of emissions performance. Notch caps on the higher power notches would be useful in preventing such situations. However, the manufacturers have indicated to EPA their concern that any notch caps would constrain their flexibility in meeting the emissions standards, especially at low power notches where emissions are more difficult to control than at the high power notches. EPA agrees that low power notch caps could be an unreasonable burden on manufacturers under this option, especially given the ability of the switch cycle to control those emissions. Thus, under this option, EPA is proposing notch caps only for notches four through eight. EPA requests comment on the need for notch caps under this option. The Agency recognizes that the compliance burden associated with such notch caps could be greater for remanufacturers of existing locomotives, and therefore requests comment on whether notch caps should be limited to Tier I and Tier II locomotives.

EPA believes that the dual cycle approach proposed in this notice provides the same emission reductions as the three duty-cycle approach previously discussed, but with a maximum of flexibility. Under the dual cycle approach, the line-haul duty-cycle standards will ensure control of emissions at high power notches, which account for the vast majority of in-service operations, while the switch duty-cycle standards will ensure control of emissions at the idle and low power notches characteristic of switch locomotive operations. Thus, the Agency is proposing to require all new locomotives and new engines used in locomotives to meet both the switch and line-haul duty-cycle standards. EPA is also proposing to require new locomotives equipped with hotel power to comply with both the switch and line-haul duty-cycle standards in both tractive power only and tractive plus hotel power mode in order to account for passenger locomotive emissions. EPA requests comment on whether it should require such locomotives to comply only with the line-haul duty-cycle standards when operating in tractive plus hotel power mode, rather than requiring compliance with both the switch and line-haul duty-cycle standards in this mode.

Single Cycle Option

The Agency considered a second approach suggested by the manufacturers under which a single duty-cycle would apply to all categories of locomotives, regardless of use. EPA is concerned about the ability of a single duty-cycle to effectively control emissions of all locomotives because of the emission effects of the differing uses. Switch locomotives tend to have very high percentages of idle time. Line-haul and passenger locomotives tend to spend less time at idle than switch locomotives, but more time in the high power notches. Using a single duty-cycle for all three classes would likely result in higher emissions in cases where the locomotive's operation does not resemble the duty cycle throttle notch weightings used for emissions testing. For this reason, the single cycle approach would not achieve emissions reductions equivalent to the proposed approach unless accompanied by very stringent individual notch caps, with no provisions for some small exceedance of the notch caps. EPA requests comment on the appropriateness of such a single duty-cycle and set of standards that would be based on the line-haul duty-cycle, but with stringent caps on idle and low power notch emissions in order to assure that switch locomotives certified to these standards achieve the same levels of emission reductions as switch locomotives certified to the switch locomotive standards described earlier.

EPA also requests comment on the proposed dual-cycle approach to applying the proposed standards, as well as the alternative options described in this notice, and other duty-cycle standard approaches. The Agency believes that all three options described could provide similar emission reductions. EPA requests comment on whether more than one option should be adopted, with the manufacturer given a choice of which option to comply with. In such a scenario, should a manufacturer be allowed to certify some engine families to the single or dual cycle and others to the class-specific cycle, or should a manufacturer be required to certify all of its production in compliance with only one of the options? The Agency also requests comment on how passenger locomotive hotel power should be handled under any of these approaches.

High Baseline Locomotives

EPA believes the proposed standards to be appropriate under section 213 of the Act. The proposed standards would achieve the greatest degree of reduction in emissions achievable through the use of technology that will be available, in light of cost, leadtime and other factors. However, in the course of this proposal's development the locomotive manufacturers expressed some concern about the ability of all 1973–1999 locomotives to meet the Tier 0 standards. This concern relates to some engine families produced during this period which, due to their design, have higher emissions than other locomotives produced during the same period, and for which the cost-effective technologies which are projected to be used to comply with the Tier 0 standards will not reduce emissions from these locomotives to the levels of the proposed Tier 0 standards. Additionally, the manufacturers believe that it would be difficult to certify these engines under the proposed averaging banking and trading program (ABT, discussed later in this notice), due to concerns about the availability of credits. They are concerned that independent remanufacturers would certify systems for those Tier 0 locomotive engine families that are easy to bring into compliance without putting in the extra effort that would allow them to generate emissions credits from those engine families. These remanufacturers may not develop emission control systems for those engine families that are more difficult to bring into compliance. This would leave the manufacturers to develop them, without the benefit of being able to use credits that could be generated from the engine families that are easy to bring into compliance. Thus, assuring that all Tier 0 engine families are certified under the ABT program would require much cooperation and coordination among railroads and the various entities certifying remanufactured locomotives.

Because of the reasons just discussed, the Agency is proposing, and requesting comment on, a provision by which manufacturers and remanufacturers can petition EPA to allow certification of Tier 0 locomotives based on a demonstration of a 33 percent NO_X reduction from pre-control levels for that specific engine family, rather than meeting the proposed Tier 0 NO_X standards. Under this option the Tier 0 standards for all pollutants other than NO_X would still apply. A 33 percent reduction for NO_X was chosen because this is the approximate average reduction the Tier 0 NO_X standards

would achieve from fleet average baseline levels (when factoring in the expected NO_X compliance margin of 5 percent). Such a petition would be granted based on the certifier's demonstration of infeasibility or excessive cost, as determined by the Administrator. The numerical NO_X emissions standard applicable to a given engine family certified under this option would be established by emissions testing five well-maintained locomotives in the engine family. The average of the results of these five tests would then be used as the baseline emissions level and the applicable NO_X standard would be set at a level 33 percent below baseline. Once the applicable NO_X standard is determined through this procedure, the certification process would be the same as for other Tier 0 locomotives, as discussed later in this notice. The Agency requests comment on the appropriateness of and need for this option, and whether Tier 0 locomotives and locomotive engines should be excluded from the ABT program if this certification option is adopted. EPA specifically requests comment on the need for this option in the event that the railroad-based Tier 0 certification provisions discussed in the engine family certification section of this notice are finalized. EPA believes that a railroad-based certification program would eliminate or reduce the concerns expressed about the ability of the ABT program to allow these locomotives to be certified because a railroad would have control over the locomotives it operated and could better plan for their remanufacture in a given year whereas a remanufacturer would have to estimate the engine family mix that it would remanufacture in a given year in order to plan its ABT strategy for that year. EPA requests comment on other alternative plans for addressing the issue of Tier 0 locomotives which have trouble meeting the Tier 0 standards (either for reasons of excessive cost or infeasibility), including such options as allowing Tier 0 locomotives under 2000 hp to certify to the switch duty-cycle standards (and applicable caps) only, and not requiring such locomotives to comply with the line-haul duty-cycle standards.

Other Nonroad Engines

A second issue raised by the manufacturers is the replacement of an existing tractive power locomotive engine (i.e., repowering) with an engine generally used in equipment other than locomotives. Such engines are subject to EPA's standards for nonroad engines over 37 kW, and only a small percentage of the total production of such engines would be used in locomotives. The smallest of these engines (under 1000 hp) are likely to be used in locomotives which are in captive use moving materials and equipment within industrial sites, rather than being used by railroads. Thus, their use is more likely to resemble that of industrial equipment than locomotives. Therefore, EPA is proposing that such vehicles not be defined as locomotives, and therefore would not be subject to today's proposed regulations. Engines in such vehicles must be certified as meeting the over 37 kW regulations.

Slightly larger engines (between 1000 and 2000 hp) used for repowering are more typically sold for use in locomotives for railroad switching operations. EPA is concerned that it might be overly burdensome to require such engines to be certified to two different sets of federal standards (i.e., the over 37 kW nonroad engine standards and the locomotive standards), especially given the small number used in locomotives. Further, the over 37 kW nonroad engine regulations provide emission reductions that are roughly comparable to the proposed Tier I standards for locomotives. Thus, the Agency is proposing to allow manufacturers to sell a limited number of these nonroad engines a year for use in locomotives without specifically certifying to the locomotive standards. Such engines must be certified as meeting the over 37 kW regulations.

In determining what an appropriate number of engines the Agency should allow to be sold for use in locomotives under this provision the Agency considered an exemption that is included in the aircraft regulations.[12] Aircraft, like locomotives, have an extremely low annual sales volume compared to other mobile source categories. In the aircraft regulations an exemption from the emissions standards is provided for engine families of 20 or fewer annual sales, in a market with total annual sales of approximately 1400. Using a similar ratio, the Agency considered a range for this locomotive provision from 10 per year (when compared to annual sales of freshly manufactured locomotives) to 40 per year (when compared to annual remanufactures). The Agency is thus proposing the midpoint of this range, or 25 a year, to be the number of engines (between 1000 and 2000 hp) certified to the over 37 kW regulations that can be sold for use in locomotives.

While EPA believes that the over 37 kW regulations provide similar environmental benefits as do the proposed Tier I locomotive regulations, based on the percent emissions reductions from uncontrolled baselines, the Agency is nonetheless concerned about the differences between the test procedures proposed for locomotives and those that currently apply to other nonroad engines (resulting from different duty-cycles) and the potential environmental impacts of those differences. Since the over 37 kW regulations do not apply to engines in the 1000 to 2000 hp range until 2000, EPA currently has no way of evaluating those impacts because there are no engines meeting the over 37 kW regulations which can be used to compare the results over the two test procedures. Thus, as a condition of being allowed to sell such engines for use in locomotives, the Agency would retain the authority to require that testing done for certification to the over 37 kW standards also include testing done at the locomotive power notch points. EPA will use this data to determine the validity of this provision (i.e., allowing engines certified to the over 37 kW standards to be used in locomotives) from an environmental perspective, and may choose through future rulemaking action to eliminate, limit or expand the availability of this provision on the basis of the data.

The Agency believes that the provisions for allowing some engines certified to the over 37 kW standards to be used in locomotives, as just described, are reasonable for several reasons. First, such engines are expected to have emissions levels similar to Tier I locomotive engines, but would most likely replace older locomotive engines which would otherwise remain uncontrolled (i.e., those in pre-1973 locomotives) or be remanufactured to the Tier 0 standards (i.e., 1973–1999 locomotives). Thus, an emissions benefit is expected from these engines relative to the engines they replace. Second, this provision is limited to engines under 2000 hp which, due to their lower power, tend to have lower mass emissions than higher powered line-haul locomotives (which make up the vast majority of both locomotives in service and locomotive emissions). Finally, these engines are not expected to have useful lives as long as other locomotive engines, nor are they expected to be remanufactured as many times throughout their service lives. These last two points would serve to minimize any unanticipated adverse effects of this provision.

The Agency requests comment on several aspects of this proposed provision for repowering. Should the

[12] See 40 CFR 87.7(b)(1).

Agency require, rather than just have the option of requiring, that these engines be tested at locomotive power notches, in addition to the testing required for the over 37 kW nonroad engine certification for all engines covered by these provisions? How should such engines be treated with respect to preemption? Should this allowance be limited to engines of less than 2000 hp, as proposed, or should there be separate restrictions for higher horsepower, or no restrictions at all on horsepower? Is 25 an appropriate number of engines to allow under this provision, or would a higher or lower number be more appropriate? Commenters on the proposed horsepower and sales restrictions are requested to provide economic and environmental data in support of their comments. Should this option be eliminated when the Tier II standards take effect, given that the current over 37 kW standards are not as stringent as the Tier II standards for locomotives? Commenters on this last point are requested to take into account the fact that EPA is currently in the process of developing a phase II regulation for nonroad engines over 37 kW. The Agency requests comment on whether it should consider a separate provision for engines used in repowers which are not certified according to the over 37 kW regulations which would allow manufacturers to pre-select from production those engines which will be used for in-use testing. Such a provision would make it easier for those engine manufacturers to keep track of their engines for the in-use test program. Finally, EPA developed this repower provision based on the current state of the locomotive market, where manufacturers of engines that are used in locomotives do not sell them to locomotive manufacturers to be used in locomotives with freshly manufactured chassis. EPA requests comment on whether it should extend this provision, or a similar one, to engine manufacturers for engines to be used in locomotives with freshly manufactured chassis.

As discussed later in the engine family certification section, EPA is proposing that certificates of conformity be issued for locomotives, not locomotive engines. However, EPA is proposing that engines used for repowering of existing locomotives that are not eligible to use the provisions just discussed, because they exceed either the sales or horsepower limits, be certified as locomotive engines, not locomotives. This is because such engines go into existing locomotives, which the engine manufacturer cannot control (in terms of their operating parameters such as percent of engine power in notches, engine cooling hardware, etc.). However, due to the logistical problems associated with pulling a locomotive engine from a locomotive to test it during in-use testing (discussed later), EPA is proposing that in-use testing for these engines be done on locomotives. The engine manufacturer could choose, in the event of a failure of locomotives containing its engines during the in-use testing program, to either accept the results of the locomotive tests, or to test the actual engines.

TABLE V–2.—TIER 0 EXHAUST EMISSION STANDARDS—LOCOMOTIVES AND LOCOMOTIVE ENGINES MANUFACTURED FROM 1973 THROUGH 1999

Duty-cycle or notch	Gaseous and particulate emissions (g/bhp-hr)				
	THC[1]	NMHC[2]	CO	NO_X	PM
Line-haul and passenger duty-cycle	1.0	1.0	5.0	9.5	0.60
Switch duty-cycle	2.1	2.1	8.0	14.0	0.72
Low and normal idle	.....	.....	.....	140.0	13.7
Hotel idle and notch 1	.....	.....	.....	20.5	1.7
Notches 2 and 3	.....	.....	.....	12.0	1.1
Notches 4 through 8	.....	.....	.....	11.9	0.75
Dynamic brake	.....	.....	.....	57.0	13.7

[1] Applicable to any fuel except natural gas (or any combination of fuels where natural gas is the primary fuel).
[2] Only applicable to natural gas, or any combination of fuels where natural gas is the primary fuel.

TABLE V–3.—TIER I EXHAUST EMISSION STANDARDS LOCOMOTIVES AND LOCOMOTIVE ENGINES MANUFACTURED 2000 AND LATER

Duty-cycle or notch	Gaseous and particulate emissions (g/bhp-hr)						
	THC[1]	NMHC[2]	THCE[3]	Aldhyd[3]	CO	NO_X	PM
Line-haul and Passenger Duty-cycle	0.55	0.55	0.55	0.035	2.2	7.4	0.45
Switch duty-cycle	1.2	1.2	1.2	0.076	2.5	11.0	0.54
Low and normal idle	.....	.....	.....	.....	.....	50.0	6.8
Hotel idle and notch 1	.....	.....	.....	.....	.....	10.8	0.75
Notches 2 and 3	.....	.....	.....	.....	.....	9.7	0.5
Notches 4 through 8	.....	.....	.....	.....	.....	9.3	0.57
Dynamic brake	.....	.....	.....	.....	.....	31.4	6.8

[1] Applicable to diesel, bio-diesel, or any combination of fuels with diesel as the primary fuel.
[2] Only applicable to natural gas, or any combination of fuels where natural gas is the primary fuel.
[3] Applicable to alcohol(s), or any combination of fuels where alcohol is the primary fuel.

TABLE V–4.—TIER II EXHAUST EMISSION STANDARDS LOCOMOTIVES AND LOCOMOTIVE ENGINES MANUFACTURED 2005 AND LATER

Duty-cycle or notch	Gaseous and particulate emissions (g/bhp-hr)						
	THC [1]	NMHC [2]	THCE [3]	Aldhyd [3]	CO	NO_X	PM
Line-haul and passenger duty-cycle	0.3	0.3	0.3	0.018	1.5	5.5	0.20
Switch duty-cycle	0.6	0.6	0.6	0.036	2.4	8.1	0.24
Low and normal idle	——	——	——	——	——	20.0	0.35
Hotel idle	——	——	——	——	——	10.8	0.25
Notches 1 through 8	——	——	——	——	——	6.9	0.25
Dynamic brake	——	——	——	——	——	15.0	0.35

[1] Applicable to diesel, bio-diesel, or any combination fuels where diesel is the primary fuel.
[2] Only applicable to natural gas, or any combination of fuels where natural gas is the primary fuel.
[3] Applicable to alcohol(s), or any combination of fuels where alcohol is the primary fuel.

TABLE V–5.—SMOKE (PERCENT OPACITY) STANDARDS [1]

Number of stacks	Exhaust diameter	Examined plume section	Steady-state	30-sec peak	3-sec peak
Single exhaust stack	12″ or less	Total	20	35	50
	More than 12″	Each 6″ Segment, or	10	15	20
		Total [2]	30	40	55
	12″ or less	Any one	20	35	50
		Sum of stacks	30	40	55
		Each 6″ segment, or	10	15	20
Multiple exhaust stacks	More than 12″	Total for any one	30	40	55
		Sum of stacks	40	50	60

[1] Measurement performed continuously during testing.
[2] Sum of each 6″ segment or the total, whichever is lower.

TABLE V–6.—EXHAUST EMISSION STANDARDS FOR NONROAD ENGINES ABOVE 37 kW[1]

Gaseous and particulate emissions (g/bhp-hr)				Smoke (Percent opacity)		
HC	CO	NO_X	PM	Accel	Lug	Peak
0.97	8.5	6.86	0.4	20	15	50

[1] 59 FR 31335, June 17, 1994, and 40 CFR 89.112–96 and 89.113–96.

Alternate Standards

EPA is proposing an alternate set of CO and particulate standards that are intended primarily to address locomotives which operate on alternative fuels such as natural gas. Such locomotives are expected to have higher (and more difficult to control) CO emissions than diesel-fueled locomotives, but lower PM emissions. These differences are due to the different molecular structure of alternative fuels compared to diesel fuel which result in the need to operate under different conditions (*e.g.*, different air/fuel ratios, spark ignition vs. compression ignition). The proposed alternate standards would allow higher CO emissions, but would also require lower particulate emissions. Although these alternate standards are primarily intended to address issues associated with alternative fuels, EPA is proposing that they be available for application to any locomotive. The Agency believes this is appropriate since the primary focus of today's proposal is NO_X and PM reductions, and the alternate standards would result in further PM reductions than the standards contained in Tables V–2 through V–4, with the same NO_X reductions. Manufacturers and remanufacturers could choose to comply with these alternate standards, shown in Table V–7, instead of the CO and particulate standards listed in Tables V–2 through V–4. They would not be allowed to mix the alternate CO standards with the primary particulate standards for a single engine family. Also, the particulate notch caps would apply in the same manner as under the primary option.

TABLE V–7.—ALTERNATE CO AND PM STANDARDS (G/BHP-HR)

	Line-haul cycle		Switch Cycle	
	CO	PM	CO	PM
Tier 0	10.0	0.30	12.0	0.36
Tier I	10.0	0.22	12.0	0.27
Tier II	5.0	0.10	6.0	0.12

B.3. Leadtime

The Agency is proposing an effective date of January 1, 2000 for the Tier 0 emission standards for existing locomotives (*i.e.*, locomotives manufactured from 1973 through 1999) upon remanufacture, and for the Tier I standards for freshly manufactured locomotives. The Tier II standards for freshly manufactured locomotives are proposed to take effect January 1, 2005. See Tables V–2 through V–4. EPA believes that these implementation dates allow sufficient leadtime for the development and application of the needed emission control technology. In the case of the Tier 0 and Tier I standards, discussions with the locomotive manufacturers have led the Agency to believe that the technology required is well understood as it is essentially technology currently used (or being developed for application in the 1998 model year) for on-highway diesel engines, and that the application of this technology is feasible in the timeframe proposed. EPA does not believe that it is feasible to begin the applicability of the Tier 0 and Tier I standards sooner than 2000 since this rulemaking is not expected to be completed until late 1997. While the technology required to meet these standards is currently well understood, EPA believes that the manufacturers will need two years leadtime to develop and finalize production plans for model year 2000 production. The 2005 implementation date proposed for the Tier II standards allows several additional years for the development and application of the technology needed in addition to that used to comply with the Tier I standards. The Agency believes that seven years total leadtime is appropriate for the Tier II standards since the locomotive industry is currently unregulated, and EPA believes that the industry needs some experience under the less stringent Tier 0 and Tier I standards before assuming liability for emissions performance under the more stringent Tier II standards. Finally, industry has known for some time the approximate levels that the Agency is proposing, and has already begun working toward compliance. The levels of the standards the Agency is proposing have been discussed in numerous meetings with the manufacturers, and were included in the development of a federal implementation plan (FIP) for ozone nonattainment areas in California.[13]

The Agency requests comment on whether the leadtime proposed is appropriate to allow compliance with the standards. Any comments suggesting that either more or less leadtime is required should include technical justification of the need as well as an estimate of the appropriate leadtime. Also, the Agency requests that comments favoring more leadtime address the impacts that a delay of the proposed implementation schedule would have on the ability of severe and extreme ozone nonattainment areas to attain the national ambient air quality standard for ozone by the applicable date (2005 or 2007 for severe areas, and 2010 for the South Coast nonattainment area in California, currently the only extreme ozone nonattainment area), and on the ability of attainment areas to maintain that status. Finally, EPA requests that comments favoring more leadtime address the possibility of other approaches to resolving the issue, such as a phase-in of the Tier 0 and/or Tier I standards, or less stringent standards for Tier I.

B.4. Useful Life

EPA proposes that a locomotive or locomotive engine covered by today's standards be required to comply with the standards throughout its useful life. The useful life would be defined using the typical period that a locomotive engine is expected to be properly functioning. A locomotive engine's emissions-critical components should be built to be at least as durable as the rest of the engine. That is to say, for the time period that the engine is expected to be functioning properly, with respect to reliability and power output, it must comply with the proposed emission standards. This time period is one that EPA sets based on general practice, not an engine by engine time period that ends if the locomotive engine is poorly manufactured and stops functioning properly earlier than expected. It should be noted that greatest practical significance of the useful life period is that it defines where in-use compliance testing will be conducted (*i.e.*, in-use testing is conducted at 75 percent of useful life), as is discussed later in this notice.

Given the above description, the Agency has decided to base its numerical definition of a locomotive engine family's useful life on the average period between remanufactures (or from remanufacture to scrappage) for that family. EPA believes that this period is most closely linked to the period during which a locomotive is designed to be properly functioning. However, because the average period between remanufactures varies from railroad to railroad for any given locomotive model, EPA has decided to propose minimum (or default) useful life numbers for each Tier of standards. EPA believes that the best indicator of the interval between remanufactures is work done (expressed as MW-hr), which is dependent on the horsepower (hp) of a locomotive. Thus, the proposed definition of useful life is based on MW-hr. However, mileage between remanufactures is also meaningful, and many existing locomotives are not equipped with MW-hr meters. Therefore, the proposed definition for minimum locomotive useful life for Tier 0 locomotives is expressed both as miles and MW-hr, with the MW-hr levels being a function of the rated power of a locomotive. Tier 0 locomotive useful life is proposed to be defined as mileage for locomotives not equipped with a MW-hr meter, and mileage or MW-hr, whichever occurs first, for Tier 0 locomotives equipped with MW-hr meters. The proposed values are shown in Table V–8. The Agency is not proposing that mileage values be included in the minimum useful life definitions for Tier I and Tier II locomotives, but is presenting them for comment in Table V–8. Similarly, EPA is not proposing that the number of years be included in the minimum useful life definitions, but has included year values in Table V–8 for comment. If EPA were to adopt more than one criteria for useful life in its definition (e.g., miles and MW-hr), the end of a locomotive's useful life would occur at the point when the first of those multiple criteria is met (e.g., useful life is defined as miles or MW-hr, whichever occurs first).

The Agency expects that locomotive manufacturers will continue work on developing locomotives which will operate longer between remanufactures than current locomotives. For this reason, EPA is proposing that locomotive and locomotive engine manufacturers be required to specify a longer useful life than the minimum if a longer period between remanufactures is intended for the locomotive than the minimum useful life interval. EPA would determine if a longer useful life is needed based on information such as a manufacturer's recommended time to remanufacture, or on in-use data showing that a locomotive engine family is consistently operating properly well past its useful life period. The Agency will also allow manufacturers to petition for shorter useful lives in unusual circumstances where an

[13] The California FIP, signed by the Administrator 2/14/95, is located in EPA Air Docket A–94–09, item number V-A–1. The FIP was vacated by an act of Congress before it became effective.

individual engine family does not achieve the minimum useful life in-use.

The remanufacture data provided by the railroad industry showed that average remanufacture intervals for different models of locomotives operated by different railroads varied from about 300,000 to 1,400,000 miles, or about 9,300 to 35,000 MW-hr. This variation made the task of establishing a minimum useful life period very difficult, especially for Tier 0 locomotives. The proposed minimum values fall in middle of these ranges, which means that some current locomotives are being remanufactured long before they reach the proposed minimum useful life values. However, EPA believes that the proposed values are appropriate for several reasons. First, future locomotives are expected to last longer between remanufactures than the existing fleet. The Tier 0 minimum useful life values will not only apply to locomotives remanufactured in 2000, but also to locomotives remanufactured well into the next century. Second, the proposed regulations include flexibility to allow manufacturers to request a shorter useful life for any engine family that is typically remanufactured before reaching the minimum useful life. Finally, EPA believes that there is a significant environmental risk associated with a useful life that is too short. It is possible that significant noncompliance could occur if most locomotives continue to operate significantly beyond the point at which they are tested for compliance in-use. A long useful life ensures that the period of operation after testing will be minimized.

The Agency requests comment on all aspects of the proposed useful life definition. Specifically, comment is requested on whether MW-hrs and miles are the most appropriate measure of a locomotive's useful life, or whether other measures (e.g., fuel usage, years) should be considered and, if so, how they should be measured. The Agency is also considering a separate useful life definition of 12 years for Tier 0 locomotives dedicated to switching operation. This is because it is often difficult to quantify mileage accumulation for switch locomotives. EPA requests comment on this possible approach to Tier 0 switch locomotive useful life definition, and whether periods higher or lower than 12 years would be more appropriate. The Agency also requests comment on whether it should consider allowing different useful lives within a given engine family for locomotives which will be used in substantially different applications than other locomotives in the same engine family. Finally, the Agency recognizes that the useful life definition just presented is based on a limited amount of remanufacture data, and encourages the inclusion of additional remanufacture data with comments. The Agency will fully consider any new data on the average period between remanufactures.

TABLE V–8.—MINIMUM USEFUL LIFE VALUES

	Miles	Years	Megawatt-hours	Megawatt-hours for 4000 HP Locomotive
Tier 0	750,000	10	7.5 X hp	30,000
Tier I	800,000	10	8.0 X hp	32,000
Tier II	900,000	10	9.0 X hp	36,000

B.5. Averaging, Banking and Trading

Consistent with the Act's requirement that EPA set emissions standards for new locomotives and new locomotive engines which achieve the greatest degree of emissions reductions achievable while considering cost and other factors, EPA is proposing a certification averaging, banking and trading (ABT) program for manufacturers and remanufacturers of locomotives and locomotive engines. Such a program would allow the manufacturers and remanufacturers the flexibility to meet overall emissions goals at the lowest cost, while allowing EPA to set emissions standards at levels more stringent than they would be if each and every engine family had to comply with the same numerical standards. This program would allow certification of one or more engine families within a given manufacturer's or remanufacturer's product line at levels above the emission standard, provided the increased emissions are offset by one or more families certified below the emission standard, such that the average of all considered emissions for a particular manufacturer's product line (weighted by horsepower, production volume and useful life) is at or below the level of the emission standard. Within the engine family, each engine must comply with the standard set for that family (the family emission limit, or FEL). The proposed banking program would also allow manufacturers and remanufacturers to generate emission ''credits'' and bank them for future use in averaging or trading. This proposed ABT program is modeled after similar programs already in place for on-highway and nonroad engines. While the practical effect of the proposed ABT program is that a manufacturer's or remanufacturer's production must, on average, meet the applicable emissions standards, compliance with the program is calculated on a total mass basis. This is to account for differences in the horsepower and useful life of different engine families (i.e., the credits for an engine family are weighted according to horsepower, production volume and useful life).

When a manufacturer or a remanufacturer uses ABT, it would be required to certify each participating engine family to a family emission limit (FEL) which is determined by the manufacturer or remanufacturer during certification testing. A discussion of the proposed engine family definition is contained in the section on compliance issues. A separate FEL would be determined for each pollutant which the manufacturer or remanufacturer is including in the ABT program. EPA is proposing an FEL ceiling of 1.25 times the applicable standard, so that no engine family could be certified at an emissions level higher than 1.25 times the applicable standard.

As was previously discussed, the Agency is proposing to require that all locomotives meet both the line-haul and switch duty-cycle standards, so that more than one standard (and accompanying duty cycle) applies to a single pollutant. This presents a unique situation for the proposed locomotive ABT program in comparison to other mobile source ABT programs where the participating vehicles or engines only have to meet one standard for a particular pollutant. The Agency is proposing separate switch and line-haul ABT programs in order to address the

issues that multiple standards for the same pollutant raise. Each engine family would be allowed to participate in both the switch and line-haul ABT programs. However, line-haul credits could not be used to meet the switch standards, and vice versa.

EPA is proposing that ABT credits be weighted according to a locomotive's useful life, if specified as work, or a combination of horsepower (hp) and useful life if the useful life is defined as miles. This is consistent with the Agency's ABT program for on-highway heavy-duty engines. EPA is considering restricting the exchange of credits between locomotives above 2000 hp and below 2000 hp to prevent credits generated by higher powered engine families from being used to allow lower powered switch locomotive engine families to remain essentially uncontrolled. Reducing emissions from switch locomotives is a significant concern given that switch locomotives are more likely to operate exclusively in urban areas, and EPA is concerned that allowing free exchange of credits between high and low powered locomotive engine families would not achieve such reductions. The Agency requests comment on whether it should prohibit or restrict credit exchange between locomotives above and below 2000 hp.

Consistent with the ABT program for on-highway heavy-duty engines, the locomotive ABT program is proposed to be limited to NO_X and PM emissions only. EPA does not believe that the proposed CO, HC and smoke standards are so stringent that they should be included in the ABT program. Also, The ABT program is proposed to be applicable to the duty-cycle emissions only. EPA believes that extending the ABT program to include the individual notch caps would result in a program that is too complex to be practical. Individual notch caps would be adjusted for locomotives which participate in the ABT program by prorating them on the basis of the ratio of the standard and the FEL. Averaging, banking and trading of credits would be limited to locomotive engines subject to the same set of standards (i.e., Tier 0, Tier I, Tier II). For example, credits generated on a Tier I locomotive could not be used towards a Tier II locomotive's compliance. The Agency requests comment on whether it should allow some degree of credit use across different sets of standards and, if so, for how long, and what effect if any this should have on the level of the standards. For example, should EPA allow Tier I credits to be used toward the first year (or more) of Tier II compliance?

EPA is also proposing to exclude from the ABT program Tier 0 locomotives certified pursuant to the 33 percent NO_X reduction option discussed in the above section on emission standards. As was discussed previously, the 33 percent NO_X reduction option is being proposed due to the potential difficulties of certifying certain Tier 0 engine families under the proposed ABT program. Additionally, the Agency is proposing that a remanufacturer who certifies a Tier 0 engine family under this option not be allowed to include any of its other Tier 0 engine families in the averaging, banking and trading program, and requests comment on this proposed prohibition.

As was previously discussed, the Agency is proposing that engine families which contain passenger locomotives equipped with a single engine for both traction power and hotel power be required to meet both the line-haul and switch duty-cycle standards both when providing traction power only, and when providing both traction power and hotel power. For the purposes of ABT, EPA is proposing that a single FEL for each pollutant be declared for such engine families based on the mode of operation of the higher emission rate. These FELs would cover the locomotive in both power modes.

The ABT program raises a unique issue for remanufactures of locomotives and locomotive engines. A manufacturer of freshly manufactured locomotives can plan its year's production in advance with the ABT program in mind. However, a remanufacturer is much less able to plan for the complexities of the program due to the greater number of engine families, the fact that more than one entity could remanufacture a given engine family, the larger number of customers for remanufacture kits than for freshly manufactured locomotives, the inability to predict how many engines will be remanufactured in a given year, and other factors. To account for this situation, EPA is proposing that a locomotive or locomotive engine subject to the Tier I or Tier II standards, when remanufactured, must meet the standards and/or FELs it was certified as meeting when it was originally manufactured (or, in the case of Tier 0 locomotives and locomotive engines, when it was first remanufactured following the effective date of these proposed standards). The Agency is requesting comment on several aspects of this provision. First, should EPA allow a remanufacturer to generate credits by certifying a remanufacture at a level below the locomotive's original FELs? Second, should the Agency consider simply ignoring the locomotive's original FELs, and institute an averaging, banking and trading program for remanufactured locomotives and locomotive engines under which credits would be generated on the basis of reductions beyond the remanufacture standards (as applicable), rather than on the basis of reductions beyond any FELs the locomotive or locomotive engine was previously certified as meeting? Finally, should the Agency place any restrictions on the exchange of credits between remanufactured and freshly manufactured locomotives?

As was previously mentioned, EPA is proposing to weight ABT credits according to useful life, and power (if useful life is expressed in miles). This raises a unique situation for the treatment of Tier 0 locomotives, whose useful lives can be expressed as either MW-hr (if equipped with a MW-hr meter) or miles (if not equipped with a MW-hr meter). These two definitions of useful life for Tier 0 locomotives result in a situation where credits based on one definition are not interchangeable with credits based on the other definition, and there is no reliable way to correlate between the two (*i.e.*, there is no standard relationship that would allow accurate conversion from one form to the other). The Agency is proposing that separate averaging sets be established for Tier 0 locomotives, one for those whose useful life is defined in MW-hr and one for those whose useful life is defined in miles, in order to deal with incompatible credit calculations. Credit use would be restricted to within each of the two sets. The Agency requests comment on this approach, as well as two other options it considered. The first alternative has a parallel in other mobile source ABT programs such as those for on-highway heavy-duty engines and nonroad compression ignition engines over 37 kW. In those programs, when a participating engine family has engines of more than one power (hp) rating, the manufacturer is required to generate credits based on the lowest hp rating in an engine family, but can only use credits based on the highest hp rating in an engine family. Using a similar approach for locomotives, an estimated range of conversion factors to equate MW-hr and mileage would be established. When generating or using credits, the endpoints of the range would be used in a conservative fashion to minimize credit generation and maximize credit usage. The second alternative EPA considered was simply

to require that all Tier 0 locomotives be equipped with MW-hr meters, thus resulting in a single useful life definition (MW-hrs) for Tier 0 locomotives, and a single category of credits for Tier 0 locomotives.

The leadtime the Agency is proposing for compliance with today's emissions standards is intended to allow all engine families to be able to comply. EPA recognizes that some engine families may be able to comply prior to the effective date of the proposed standards. However, EPA expects that these proposed regulations will be finalized in December of 1997, by which time the manufacturers are expected to have finalized their 1998 and 1999 production plans. Thus, the Agency does not believe it would be practical to require a phase-in of the proposed standards prior to 2000 across the entire industry, but would like to encourage the early introduction of cleaner locomotives. Thus, EPA is proposing to allow manufacturers and remanufacturers to begin banking credits for locomotives and locomotive engines as early as one year prior to the effective date of the standard, (*i.e.*, the 1999 model year). EPA is proposing that, for early banking, manufacturers and remanufacturers could receive NO_X and/or PM emission credits for engines certified to FELs below the NO_X and/or PM standards which take effect in 2000. The NO_X and PM credits would be calculated based on the difference between the FEL and the corresponding emission standard for the appropriate duty-cycle. The Agency requests comment on whether it should further encourage the early introduction of cleaner locomotives and locomotive engines by giving credits for early certification in excess of what would be generated relative to the applicable standards. For example, should a locomotive which is certified as meeting the Tier I standards in 1999 be given credit relative to the Tier 0 standards, given that it would otherwise not have to meet any standards initially, and only the Tier 0 standards at remanufacture? EPA recognizes that credits generated early could be used in later years and that there may be little net benefit in the long term from such an approach, but nonetheless sees a benefit in encouraging earlier emissions reductions.

Consistent with the current ABT program for nonroad engines over 37 kW, credits are proposed to have a three year lifetime with no annual discounting. The Agency requests comment on the proposed three year credit life, as well as an infinite credit life. The Agency also requests comment on the proposal that credits not be discounted with time, as well as annual discounting rates of up to 20 percent.

Participation in the proposed locomotive ABT program would be voluntary. For those manufacturers and remanufacturers who choose to utilize the program, compliance for participating engine families would be evaluated in two ways. First, compliance of individual engine families with their FELs would be determined and enforced in the same manner as compliance with the emission standards in the absence of an averaging, banking and trading program. Each engine family must certify to the FEL (or FELs, as applicable), and the FEL would be treated as the emission limit for certification, production-line and in-use testing for each engine in the family. Second, the final number of credits available to the manufacturer or remanufacturer at the end of a model year after considering the manufacturer's or remanufacturer's use of credits from averaging, banking and trading must be greater than or equal to zero.

When credits are generated and traded in the same model year, EPA proposes to make both buyers and sellers of credits potentially liable for any credit shortfalls, except in cases where fraud is involved. This provision is consistent with other mobile source ABT programs. The certificates of both parties issued for locomotives and locomotive engines involved in the violating trading transaction could be voided *ab initio* (i.e., back to date of issue) if the engine family or families exceed emission standards as a result of a credit shortfall.

The integrity of the proposed locomotive averaging, banking and trading program depends on accurate recordkeeping and reporting by manufacturers and remanufacturers, and effective tracking and auditing by EPA. Failure of a manufacturer or remanufacturer to maintain the required records would result in the certificates for the affected engine family or families being voided retroactively. Violations of reporting requirements could result in a manufacturer or remanufacturer being subject to civil penalties as authorized by sections 213 and 205 of the Clean Air Act.

EPA requests comment on all aspects of the proposed averaging, banking and trading program. Specific comment is requested as to whether the program should be limited to just NO_X and PM, as proposed, or whether the other regulated pollutants should be included. Also, the Agency requests comment on the various restrictions (averaging sets, etc.) proposed for this program.

C. Compliance Assurance

Section 213(d) of the Clean Air Act, which applies to EPA's proposed emissions standards for locomotives, provides that such standards ''shall be enforced in the same manner as standards prescribed under section (202)'' of the Act (applicable to new motor vehicles and new motor vehicle engines). This provision also grants EPA discretion to revise the regulations implementing certification, in-use testing and recall if appropriate for locomotives and other nonroad vehicles and engines. EPA uses several mechanisms to enforce its motor vehicle emissions standards, including certification, production line testing, in-use testing and recall. This section covers the various aspects of these proposed compliance programs for locomotives. A discussion of the proposed definition of locomotive engine family is presented first, followed by discussions of the three main compliance programs (certification, production line testing and in-use testing).

C.1. Engine Family Definition

EPA defines engine family for all other mobile sources as a group of engines expected to have similar emissions characteristics throughout their useful lives. The engine family concept facilitates more efficient certification of engines or vehicles by allowing those with similar emissions characteristics to be grouped together, thus reducing testing costs. In defining engine family for locomotives and locomotive engines, the Agency sought to balance the economic advantage of a broad definition that would minimize testing and certification costs, and the environmental advantage of a narrow definition that would better assure that the testing of an engine family would accurately represent all engines in that family. The Agency is proposing to define engine family for locomotives using many of the same parameters which are currently used to define on-highway and nonroad engine families. These parameters include aspects of both the physical design of the engine (e.g., combustion chamber configuration, cylinder bore and stroke) as well as operating characteristics (e.g., fuel injection pressure and rate, turbocharger and inlet air cooling characteristics). A complete list of the parameters is included in section 92.010 of the proposed regulations.

While the proposed locomotive engine family definition uses many of

the same parameters as engine family definitions adopted by EPA for other classes of mobile sources, the engine family definition proposed here for locomotives is somewhat more narrowly defined, especially for Tier I and Tier II. Characteristics such as fuel injection pressures and turbocharger and aftercooler performance are included in this definition.

EPA does not believe that the above outlined approach to defining engine family will result in an excessive number of engine families. For Tier I and Tier II the Agency expects that a manufacturer may only have a single engine family in a given model year. However, the Agency is requesting comment on whether it should allow for the combining of small Tier 0 engine families into a single engine family in order to reduce the testing burden imposed by the Tier 0 standards. Comments should address the size of the engine families which can participate, as well as the justification for allowing them to be classified as a single engine family and recommended criteria for separating families.

C.2. Engine Family Certification

Certification is the process whereby a manufacturer or remanufacturer obtains a certificate of conformity for a particular engine family of locomotives. A certificate of conformity must be obtained before a manufacturer or remanufacturer may lawfully offer for sale or otherwise introduce (or reintroduce) into commerce new locomotives and new locomotive engines. The CAA establishes an annual certification requirement for new vehicles and engines, including new locomotives and new locomotive engines.[14] Under the proposed regulations, a separate certificate must be obtained for each engine family. Applications must be submitted every year, even when the engine family does not change from the previous certificate, although representative test data could be reused in the succeeding year's application in order to minimize the testing burden.

As discussed in the following paragraphs, EPA is proposing that locomotives (rather than engines) be tested for demonstration of compliance with the applicable emissions standards. EPA is also proposing an exception to this requirement which would allow test data from a development engine to be used for certification, rather than requiring testing of a pre-production prototype locomotive. Nevertheless, it is the actual locomotive, not the engine, for which a certificate of conformity would be issued, and the Agency is proposing that locomotives, not engines, be tested during production line and in-use testing programs. These programs are discussed later in this notice. The only exception to the proposed requirement that a certificate of conformity be issued for locomotives, rather than engines, is in the case of engines which are sold for purposes of repowering existing locomotives, as previously discussed. This exception is not proposed to be extended to locomotive engines which are sold to locomotive manufacturers for use in freshly manufactured chassis. The Agency is also proposing to prohibit defeat devices which sense operation outside of the normal certification test conditions and reduce the ability of the engine to control emissions under non-test conditions. Finally, EPA is proposing that manufacturers and remanufacturers of locomotives be required to specify a range for adjustable parameters which can affect emissions such that the locomotives will comply with the applicable standards with the parameters set anywhere within their specified range. These provisions are discussed in the following paragraphs.

Under EPA's current motor vehicle program, the certification process includes an up-front showing of emissions durability. This is done through an emissions durability vehicle which is operated more or less continually to accumulate mileage representative of in-use operation. Thus, a motor vehicle's ability to meet the emission standards throughout its useful life is demonstrated as part of the initial certification process, although under somewhat artificial conditions. With locomotives, which are built to operate continually and have very long useful lives, this type of accelerated usage is not feasible. Such a demonstration would take several years to complete, compared to several months for on-highway passenger cars, and could require more than $1 million in fuel. Thus, including a durability showing in the initial certification process is not appropriate in light of the cost and time involved in making such a showing. The Agency is, therefore, proposing no durability demonstration be required for certification. However, a manufacturer or remanufacturer must still estimate in-use emissions deterioration as part of the certification process (through engineering evaluation or other means), but need not do so by operating a locomotive for its entire useful life. Compliance over the full useful life will be ensured by the production line and in-use testing programs (discussed in the following sections), which EPA considers extremely important aspects of the proposed program to control emissions from locomotives. The Agency is considering, and requests comment on, whether it should develop optional assigned deterioration factors based on the initial results of the in-use testing program (discussed later).

EPA believes that, in order to accurately measure locomotive emissions, the locomotive, not just the engine, should be tested. However, EPA recognizes that the locomotive manufacturing industry is unusual in the way it develops new products. Typically, a manufacturer will have a single engine mounted on a dynamometer which may remain there for years. This development engine serves as a test bed for changes in the engine's design. Given the relatively small volume of locomotives and locomotive engines manufactured, combined with their very high per-unit cost, the Agency is proposing that as an option to certification testing of a complete locomotive, test data from this development engine be allowed to be submitted for certification. This is in contrast to other EPA mobile source programs where a pre-production prototype engine or vehicle is used to generate emissions data. As a condition of certifying a locomotive using data from a locomotive engine rather than a complete locomotive, a manufacturer or remanufacturer must accept liability for a certificate suspension and/or recall action based on production line or in-use testing of locomotives. Additionally, for engine families which are certified using development engine data, one of the first five locomotives manufactured will be tested as part of the production line testing program, which is discussed later.

This development engine would be required to be tested at power points which correspond to the actual notches of the locomotive the engine will be used in. In general, the certification testing is the only time that EPA proposes that the engine, rather than the locomotive, could be tested. For production line and in-use testing (discussed next), EPA proposes that the actual locomotives be tested in order to assure that the locomotive engine is being operated at conditions that represent those in a locomotive (e.g., intake air and coolant temperatures,

[14] Section 206 of the Clean Air Act requires certification on a yearly basis. This has been interpreted to mean certification for each model year, as defined in section 202(b)(3)(A)(i) of the CAA. Section 206 applies to locomotives, pursuant to section 213(d) of the Act.

power at throttle notches). As is discussed in the section on production line testing, a waiver from the requirement that locomotives (not engines) be tested under the production line testing program will be available for those manufacturers and remanufacturers which only manufacture or remanufacture engines used to repower existing locomotives.

While EPA is proposing to allow data from a development engine to be used for certification testing, the Agency is aware that parts of this engine may have been in operation for some time when the engine is tested. Thus, the data used for certification may not accurately reflect the emissions performance of a freshly manufactured engine. The application for certification would include a demonstration, which could be based on good engineering judgement, that the locomotive or locomotive engine will meet the applicable emission standards throughout its useful life. Thus, the manufacturer or remanufacturer would be required to use engineering judgement or test data to develop a deterioration factor (df), subject to EPA approval, for the development engine which would account for any expected emissions deterioration. As part of the application for certification, EPA proposes to require the applicant to also provide a df, also subject to EPA approval and based on engineering judgement or test data, which could be applied to a freshly manufactured unit to give its emissions rate at the end of its useful life. This df might be different than the one generated for use with the development engine data, and it would be used for production line testing of new locomotives and locomotive engines.

When no significant changes to an engine family occur from one model year to the next, EPA proposes to allow manufacturers and remanufacturers the flexibility to submit emission test data used to certify the engine family in previous years in lieu of actual testing for current year certification. This can be done to certify an engine family which is the same as, or substantially similar to (as determined by the Administrator), the previously certified engine family, provided these data show that the test engine would comply with the applicable regulations. This allows manufacturers the ability to ''carry over'' test data from the same engine family from one model year to another.

The proposed remanufacture requirements for locomotives raise a unique question regarding who should be required (or allowed) to hold the certificate of conformity for a remanufactured locomotive engine family. Section 206 of the Act, which applies to locomotives pursuant to section 213(d), states that the Administrator shall test new vehicles and engines submitted by a manufacturer to determine compliance with applicable emissions standards and shall issue a certificate of conformity if the vehicle or engine conforms to EPA regulations. Section 203(a)(1) prohibits manufacturers from introducing into commerce new vehicles and engines that are not covered by a certificate of conformity issued by EPA. Because section 213(d) states that EPA's locomotive emissions standards shall be enforced in the same manner as the federal motor vehicle emissions standards, it is appropriate to apply the prohibition against introduction into commerce without a valid certificate to manufacturers of new locomotives and new engines used in locomotives. Since EPA proposes to define remanufactured locomotives as new, these provisions apply to both remanufactured and freshly manufactured locomotives. Section 216 defines ''manufacturer'' as any person engaged in the manufacturing or assembling of new nonroad vehicles or new nonroad engines. This definition envisions manufacturing of a new vehicle or engine, at least in some cases, as being something other than simply assembling the new vehicle or engine. EPA has considered the remanufacturing process for locomotives and engines to determine which entity or entities should be considered a manufacturer for purposes of compliance with emissions standards. For remanufactured locomotives and engines, several different entities may be ''engaged in the manufacturing or assembling'' of the new locomotive or engine, potentially resulting in multiple manufacturers of a remanufactured locomotive or engine. A railroad company may remanufacture its locomotives or engines itself. A railroad may otherwise play a significant role in the process of design, production, or installation of parts in the remanufacturing process. A third party may install the remanufacturing kit. Such kits, in turn, could be produced by a different entity. All of these parties are involved in the remanufacturing process to some extent, and can therefore be considered to be ''engaged in the manufacturing or assembling'' of the resulting new locomotive or engine. This is significantly different from the motor vehicle industry, in that no single entity conducts the entire process of manufacturing a new vehicle or engine.

The entity that makes the remanufacturing kit, containing parts used to remanufacture locomotives or engines, can be considered a manufacturer of the new locomotive or engine because such entity actually produces the components that will constitute the remanufactured locomotive or engine. The installer of the remanufacturing kit, who may or may not be a different entity, can be considered a manufacturer of the remanufactured locomotive or engine because such entity performs the installation of the remanufacturing kit to result in a new locomotive or engine. Finally, the railroad company that remanufactures its own engine, or is otherwise involved to any significant degree in the remanufacturing process, such as hire another entity to install a remanufacturing kit according to the railroad's specifications, can be considered a manufacturer of the resulting new locomotive or engine, because the railroad plays a significant role in determining the specific manner in which the locomotive or engine will be remanufactured. Because any of these entities could be considered the remanufacturer, the Agency is proposing that any of them could hold the certificate of conformity. The Agency requests comment on its legal authority to call a railroad a manufacturer in cases where the railroad is in no way involved in the remanufacturing of its locomotives.

It is possible that, given the number of entities that could be engaged in manufacturing or assembling a remanufactured locomotive engine family, there will be cases where the certificate holder will be an entity other than the installer (e.g., the entity which designs the system or manufactures the components). In such cases the certificate holder would be required, as a condition of the certificate of conformity under section 206(a) of the Act, to provide to the installer along with a remanufacture kit (which would include the necessary components or a component list including specifications for the components) instructions for the proper installation and calibration of those components, as well as any other instructions or calibrations required for that remanufactured engine family to meet the applicable emissions standards. Specific provisions for how remanufacture kits would be handled with respect to production line testing and liability are discussed later in this notice.

The Agency requests comment on whether it should require emission testing for remanufacturers certifying kits that are equivalent to kits

previously certified by other remanufacturers. Would there be any benefit to such emission testing, and if not, would it therefore be unreasonable to require it? EPA is concerned, however, that if it were to allow such certification, that it would be unfair to the original certificate holder that would have been required to perform the emission testing. One way to address this concern would involve not allowing such certification until several years after the original certificate holder had obtained the certificate; thereby giving the original certificate holder time to recover its investment. This also raises an issue of whether EPA would have authority under section 206(a) of the Act to refuse to issue a certificate based on this reason. EPA therefore requests comment on whether certification of equivalent kits without testing should only be allowed for kits that were originally certified at least five years previous.

As described above, the process of remanufacturing an existing locomotive or engine to result in a new locomotive or engine is unique to the locomotive industry, and is not common practice for other mobile sources. Pursuant to section 213(d), EPA has discretion to modify its regulations implementing sections 206 and 207 of the CAA as the Agency determines is appropriate for locomotives. EPA has analyzed the current industry practice of remanufacturing existing locomotives and engines, as well as the technical aspects of remanufacturing, and is considering an approach to certification of remanufactured locomotives and engines under which the entity that owns the locomotive or engine being remanufactured (generally a railroad company) would be primarily responsible for meeting the obligations of the manufacturer of such locomotive or engine to meet the Tier 0 standards.

As stated above, a railroad company that hires another entity to install a remanufacturing kit according to the railroad's specifications can be considered to be engaged in the manufacturing or assembling of the resulting new locomotive or engine, as can the entity hired to install the kit. In such a case, both the railroad and the installer would be subject to the obligations and prohibitions that apply to manufacturers of new vehicles and engines. To simplify the certification and enforcement process, EPA is considering specifying by regulation that the owner of the locomotive or engine being remanufactured shall be considered the primary manufacturer of the remanufactured locomotive or engine, and, as such, shall be the entity that EPA will look to for compliance with certification and enforcement requirements relating to its remanufactured locomotives and engines. EPA believes that it is appropriate to specify the owner of the remanufactured locomotive or engine as the primary manufacturer, rather than the installer of the kit, because the former entity has the greatest degree of control over the manner in which the existing locomotive or engine is remanufactured; the railroad provides the specifications that the remanufactured engine must meet and maintains ownership of the locomotive, or physical control in the case of a leased locomotive. The installer simply follows the directions provided by the owner; while installation of the remanufacturing kit renders the installer a manufacturer of a new locomotive or engine under the CAA definition, EPA would not expect to seek recourse against the installer as the manufacturer of the remanufactured locomotive or engine (nor against any other entities that meet the definition of a manufacturer) unless the owner of such engine failed to meet its obligations as a manufacturer. However, if the primary manufacturer failed to meet certain requirements, such as failing to obtain a certificate prior to introducing the remanufactured engine into commerce, then all parties who meet the definition of manufacturer, with regard to such engines would be considered to be in violation of section 203(a)(1) of the Act, not just the primary manufacturer.

EPA believes that such an approach could potentially have much less impact on the existing markets for parts and remanufacturing for these locomotives. EPA also believes that such an approach would ensure compliance with the proposed emission standards equivalent to that of the proposed remanufacturer based certification process previously discussed. EPA is concerned, however, that there could be unforeseen problems associated with attempting to establish a program that is fundamentally different from all other mobile source programs. The Agency does not believe that there is the same potential for negative market impacts for the remanufacture of locomotives originally built after the effective date of this rule due to the fact that those locomotives would slowly be introduced into the fleet, and thus the remanufacturing market for them would develop slowly as they aged. Nonetheless, EPA also requests comments on whether a railroad-based certification program should be established for the remanufacture of Tier I and Tier II locomotives.

Under the railroad-based certification program being considered, the certification requirements would be largely the same as those that are being proposed under the remanufacturer based certification approach. Locomotives and locomotive engines would still be grouped together in engine families, certification test data would still be required from a representative worst-case configuration, and small numbers of locomotives would still be audited on the production line and tested in-use. The main difference would be that the railroads would be primarily responsible for submitting an application for certification and conducting all of the production line auditing and in-use testing, and would be liable for the emissions performance.

Under this approach, railroads would be allowed to purchase kits from manufacturers, or any other suppliers, that could be applied to engines during remanufacture to achieve the necessary emissions reductions. Railroads would also be allowed to use emissions test data collected by a kit supplier for certification. Moreover, the railroads could even make commercial arrangements to hold the kit supplier liable for in-use emission problems. Thus, the railroads could choose to certify in a manner that would be practically very similar to the manner in which it would be handled under the remanufacturer-based approach that is being proposed. Also, the smallest railroads would still be able to be exempted from the proposed compliance requirements, as discussed later in the railroad requirements section.

EPA is also proposing to reduce the reporting burden associated with the application for certification. EPA believes that it is appropriate to require manufacturers and remanufacturers to collect and maintain certification application information, but that it should not be necessary for them to submit this information in all cases unless specifically requested. The authority, as proposed, to modify what information must actually be submitted versus maintained will allow EPA to exercise some flexibility in designing and implementing the certification process for locomotives and locomotive engines. When the Agency exercises its authority to modify the information submission requirements, it will provide manufacturers and remanufacturers with a guidance document, similar to the manufacturer guidance issued under the on-highway

program, that explains the modification(s). These modifications to the information submission requirements will in no way change the actual requirements of the regulations in terms of the emissions standards, test procedures, etc. Manufacturers and remanufacturers must retain records that comprise the certification application whether or not EPA requires that all such records be submitted to the Agency at the time of certification. The Administrator would retain the right to review records at any time and at any place she designates.

As is the case for other regulated nonroad and on-highway vehicles and engines, the proposed certification regulations make it illegal for any manufacturer, remanufacturer, or any other person to use a device on a locomotive or locomotive engine which senses operation outside normal emission test conditions and reduces the ability of the emission control system to control the engine's emissions through, for example, the optimization of fuel economy at the expense of emissions performance. Such ''defeat'' devices are specifically prohibited for motor vehicles under section 203 of the Act. Section 213(d) of the Act directs the Agency to enforce the locomotive standards in the same manner as it enforces motor vehicle standards. EPA considers the current motor vehicle programs' prohibition against the use of defeat devices to be an essential tool in ensuring in-use compliance with emissions standards. For this reason, lack of a comparable prohibition for locomotives could result in a real and significant risk that locomotives will not comply with applicable standards during actual operation.

Moreover, there is no indication in the Act that Congress intended to prohibit defeat devices for motor vehicles and engines, but to allow such practices for nonroad vehicles and engines. In fact, the overall structure of the nonroad vehicle and engine provisions of the Act, as well as the explicit reference to enforcement in section 213(d), support an approach to enforcement of the emissions standards for such vehicles and engines (including locomotives) comparable to the approach used for motor vehicle enforcement. Therefore, EPA is proposing in the certification regulations an explicit prohibition against defeat devices applicable to locomotives subject to the federal standards. Since the use of defeat devices effectively renders the specified test procedures for certification, production line, and in-use testing inadequate to predict in-use emissions, EPA would reserve the right to test a certification test locomotive or engine, or require the manufacturer or remanufacturer to perform such testing over a modified test procedure if EPA has reason to believe a defeat device is being used by a manufacturer or remanufacturer on a particular locomotive or locomotive engine. EPA solicits comments on this proposed provision.

EPA regulations applicable to on-highway vehicles contain provisions which allow for testing with any adjustable parameter set anywhere within its adjustable range. The purpose of these provisions is to ensure that variation in parameters which mechanics or vehicle operators can adjust using low cost tools, when set anywhere within the adjustable range, would not cause the vehicle to exceed emissions standards. Production tolerances on such large engines, as well as the need to grind smooth, plate, or otherwise process certain parts during remanufacture in such a way that their physical dimensions change, result in the need for locomotive adjustable parameters to have much wider ranges of adjustability than those of on-highway vehicles. An engine which is designed to be remanufactured numerous times throughout its service life needs to be manufactured such that some of its parameters have physically adjustable ranges which are much larger than their functional ranges when the engine is running in order to account for the change in dimension of parts which are processed in some way during remanufacture, as described above. Requiring that a locomotive be able to demonstrate compliance with applicable emissions standards with its parameters adjusted anywhere within their adjustable range is not reasonable. However, correct setting of adjustable parameters (e.g., injection timing) is critical for good emissions performance. EPA is proposing that manufacturers and remanufacturers specify a tolerance range for each adjustable parameter within which compliance with emissions standards will be achieved. Any locomotives which are inspected and found to have adjustable parameters set outside of the range specified by the manufacturer or remanufacturer will be considered to have been tampered with, and the owner/operator of such locomotives will be subject to tampering penalties, as discussed below in the tampering section.

EPA is authorized under section 217 of the Clean Air Act to establish fees to recover compliance program costs associated with sections 206 and 207 of the Act. Sections 206 and 207 apply to locomotives and locomotive engines pursuant to section 213(d) of the Act. Therefore, EPA has authority to establish fees for locomotive and locomotive engine testing pursuant to section 217. EPA proposes to establish fees for this locomotive compliance program at some future time after the program is in place and the associated costs to EPA can be determined.

C.3. Production Line Testing Program

EPA is proposing a production line testing (PLT) program pursuant to the Agency's authority to implement and enforce the locomotive emissions standards. Section 213(d) subjects the nonroad (including locomotive) standards to the provisions of section 206 of the Act, with such modifications that the Administrator deems appropriate to the regulations implementing section 206, and directs EPA to enforce the nonroad standards in the same manner as the Agency enforces motor vehicle standards.

Section 206(a) provides EPA authority to issue certificates of conformity with applicable emissions standards to vehicles that demonstrate compliance with such standards. Section 206(b) authorizes testing of new vehicles and engines being manufactured to determine whether such vehicles and engines actually comply with the certificate of conformity (i.e., testing of vehicles and engines as they come off the production line). If the results of such testing show that all or part of the relevant vehicles or engines do not comply with the certificate, EPA may suspend or revoke the certificate in whole or in part. Section 206(b)(1) provides that such testing may be conducted directly by the Agency, or by the manufacturer in accordance with conditions specified by the Agency.

Pursuant to its authority under section 206, as applied to locomotive emissions standards according to section 213(d), EPA is proposing that manufacturers and, in some cases, remanufacturers of locomotives perform production line testing of newly manufactured and remanufactured locomotives. The PLT program would be an emission compliance program in which manufacturers would be required to test locomotives as they leave the point where the manufacture is completed. The objective of the PLT program is to allow manufacturers, remanufacturers and EPA to determine, with reasonable certainty, whether certification designs have been translated into production locomotives that meet applicable standards and/or FELs from the beginning, and before excess emissions are generated in-use.

EPA believes that a PLT program is necessary to verify that new locomotives and new locomotive engines comply with applicable regulations. This program is especially important given that EPA is proposing to allow certification of freshly manufactured locomotives and locomotive engines based on data from a development engine, rather than a pre-production prototype locomotive. The Agency is concerned that testing conditions during engine testing (percent power at notches, air and coolant temperatures, etc.) may not accurately reflect actual operation in a locomotive, resulting in emissions which may not accurately reflect actual locomotive emissions. It is for this reason that EPA is proposing that one of the first five freshly manufactured locomotives produced be tested as part of the PLT program if development engine test data is used for certification. EPA is proposing different PLT programs for freshly manufactured and remanufactured locomotives and locomotive engines. As discussed in the following paragraphs, the Agency is proposing that the PLT program for freshly manufactured units be based on actual testing, while the PLT program for remanufactured units would be based on an audit of the remanufacture (e.g., assuring that the correct parts are used and they are installed properly), with EPA having the ability to require testing if in-use data indicates a possible problem with production.

Manufacturers of freshly manufactured locomotives would be required to demonstrate that locomotives randomly selected by them meet applicable emissions standards and requirements. All PLT emission results and quarterly production figures would be required to be reported electronically to EPA each quarter. EPA would review PLT data and the procedures used in acquiring the data to assess the validity and representativeness of each manufacturer's PLT program.

The proposed program for freshly manufactured locomotives assures that locomotives from each engine family will be tested periodically and that their compliance will be continuously monitored. The frequency of testing would depend on an engine family's production volume, with greatly reduced testing for small volume engine families, and a cap on the total number of tests in a given year for larger engine families. In general, testing will be performed on locomotives. However, manufacturers who only manufacture locomotive engines can perform PLT testing on engines provided those engines are only used to repower existing locomotives. If any engines produced by an engine manufacturer are used for locomotives with freshly manufactured chassis, the Agency can require that some PLT testing be done on a locomotive, rather than allowing all PLT testing to be done on engines.

EPA recognizes the need to develop a PLT scheme that does not impose an unreasonable burden on the manufacturers and remanufacturers. While EPA believes that it has developed a PLT program which takes into account the circumstances of this industry, it also understands that alternative plans may be developed that better account for the individual needs of a manufacturer or remanufacturer. Thus, provisions are proposed to allow a manufacturer or remanufacturer to submit an alternative plan for a PLT program, subject to approval of the Administrator. A manufacturer's petition to use an alternative plan should address the need for the alternative, and should include justifications for the number and representativeness of locomotives tested, as well as having specific provisions regarding what constitutes a PLT failure for an engine family.

Under the proposed PLT program, manufacturers would select locomotives from each engine family at a one percent sampling rate for emissions testing. EPA has the right to reject any locomotives selected by the manufacturers if it determines that such locomotives are not representative of actual production. Manufacturers and remanufacturers would be required to conduct testing in accordance with the applicable federal testing procedures for locomotives. Tests must be distributed evenly throughout the model year, to the extent possible.

The required sample size for an engine family would be the lesser of five tests per year or one percent of projected annual production. For engine families with production of less than 100, a minimum of one test per year per engine family would be required. These numbers were chosen to minimize the testing burden on the manufacturers but still allow an adequate testing sample to determine conformity with the applicable requirements. Manufacturers could elect to test additional locomotives. Manufacturers would be required to submit quarterly reports to EPA summarizing locomotive test results, test procedures, and events such as the date, time, and location of each test. Quarterly reporting will allow EPA to continually monitor the PLT data, and is consistent with current reporting requirements in the PLT program of the marine engine regulations and on the voluntary assembly line test program for on-highway vehicles and engines. If no testing is performed during a quarter, no report would be required.

Under this testing scheme, if a locomotive fails a production line test, the manufacturer would test two additional locomotives out of the next fifteen produced in that engine family in accordance with the applicable federal testing procedures for locomotives. When the average of the three test results, for any pollutant, are greater than the applicable duty-cycle, FEL, or notch standard for any pollutant, the manufacturer fails the PLT for that engine family. In all cases, individual locomotives which failed a test in the PLT program would be required to be brought into compliance.

This program is different than the approach that EPA has traditionally used for mobile sources, such as on-highway motor vehicles and nonroad marine engines. The more traditional approach used for assuring that the engines are produced as designed for other mobile sources is called Selective Enforcement Auditing (SEA). 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 the deterrent effect: The premise is that manufacturers would design their engines and production processes and take other steps necessary to make sure their engines are produced as designed and thereby avoid the penalties associated with failing SEA tests, should EPA unexpectedly conduct an SEA.

In the marine engine SEA program, EPA employs a statistical procedure known as the Cumulative Sum (CumSum) Procedure that enables manufacturers to select engines at appropriate sampling rates for emission testing and will determine whether production line engines are complying on average with emission standards. For an engine family to experience a failure under this approach, the CumSum statistic, which is based on previous emissions test results, must reach an appropriate action limit. Under the proposed PLT program, for a locomotive engine family to experience a failure, the average of any pollutant for three consecutive tests must be greater than the applicable standard or FEL. The procedure used for marine engines is appropriate for the marine industry which has a much higher total annual production than the locomotive industry. This procedure could prove very burdensome for the locomotive industry, so EPA feels it is appropriate to design a production line testing

program that is more suitable for their annual production volumes.

EPA has taken a different approach in the locomotive production line testing program: This program implements a more flexibly organized testing regime that acts as a quality control method that manufacturers will utilize and monitor to assure compliance. Manufacturers will continue to take steps to produce engines within statistical tolerances and assure compliance aided by the quality control data generated by PLT which will identify poor quality in real time.

In the proposed PLT program, the Administrator could suspend or revoke the manufacturer's certificate of conformity in whole or in part fifteen days after an EPA noncompliance determination for an engine family that fails the PLT, or if the locomotive manufacturer's submittal reveals that the PLT tests were not performed in accordance with the applicable testing procedure. During the fifteen day period following a determination of noncompliance, EPA would coordinate with the manufacturer to facilitate the approval of the required production line remedy in order to eliminate the need to halt production, to the greatest extent possible. The manufacturer must then address (i.e., bring into compliance, remove from service, etc.) the locomotives produced prior to the suspension or revocation of the certificate of conformity. EPA could reinstate the certificate of conformity subsequent to a suspension, or reissue one subsequent to a revocation, after the manufacturer demonstrates (through its PLT program) that improvements, modifications, or replacement had brought the locomotive and/or engine family into compliance. The proposed regulations include hearing provisions which provide a mechanism to resolve disputes between EPA and manufacturers regarding a suspension or revocation decision based on noncompliance with the PLT. It is important to point out that the Agency would retain the legal authority to inspect and test locomotives and locomotive engines should such problems arise in the PLT program.

The Agency requests comment on all aspects of this proposed PLT program. Specifically, EPA requests comment on whether it should select the individual locomotives to be tested, or whether this should be done by the manufacturer, with the selection subject to EPA approval. Also, the Agency requests comment on whether manufacturers which only manufacture locomotive engines (rather than complete locomotives) and whose engines only go toward the repowering of existing locomotives should be allowed to do PLT testing on locomotive engines, as proposed, or whether such engines should be required to be installed in locomotives prior to PLT testing. Comments in support of requiring testing of a locomotive in this situation should address logistical issues such as how much mileage should be allowed in order to get the locomotive to a suitable testing site.

During the development of today's proposal, the locomotive and locomotive engine manufacturers developed an alternative PLT program. Citing cost and time concerns with running a PLT program based on the full federal test procedure (FTP), as just described, they proposed a program based on a short test. This short test would only test locomotives at notches five and eight, rather than at all notches as in the full FTP. It would also utilize less accurate measurement equipment, and would not require the same level of training for those running the test as the proposed FTP would. EPA solicits public comment on this approach, and particularly on the liability that would be associated with a failure of such a short test, and whether the Agency could take appropriate enforcement action based on failure of a production line test which is different than the test used for initial certification. The Agency also requests commenters to address whether a less rigorous PLT program would be appropriate in light of a strong in-use testing program.

The Agency is proposing a separate program for assuring the production quality of remanufactured locomotives. Under this proposed program, the certificate holder, as a condition of the certificate, would be required to audit its remanufacture of locomotives for the use of the proper parts, their proper installation, and all proper calibrations as a condition of the certificate of conformity. The certificate holder would be required to perform these audits on 5% of its annual production. For certificate holders which sell their kits for installation by others, the audits would be required to be spread out proportionally among every entity installing them. The Agency recognizes that it may be difficult for a remanufacturer to audit kit installations from a variety of installers located throughout the country. Thus, EPA is proposing to allow a remanufactured locomotive subject to an audit to operate up to 10,000 miles prior to the audit. This will allow for audits at sites other than where the installation occurs, as well as providing the flexibility in the timing of the audits (i.e., not having to audit a locomotive the moment it completes remanufacture). A case of uninstalled, misinstalled, misadjusted or incorrect parts would constitute a failure, and additional locomotives would be required to be audited. Actions in the event of an audit failure would be determined on a case-by-case basis, depending on whether the failure is considered tampering, causing of tampering, inappropriate parts in kit, etc. EPA would retain the right to order, on a case-by-case basis, a PLT testing program for remanufactured locomotives in the same manner as the PLT program for freshly manufactured locomotives if in-use testing or kit audits showed evidence of noncompliance. EPA requests comment on the impacts of this proposed audit program for remanufactured locomotives on small businesses, and whether it should consider an exemption from this requirement for small businesses.

C.4. In-Use Testing Program

A critical element in the success of the proposed locomotive program is ensuring that manufacturers, remanufacturers, and upgraders produce new locomotives that continue to meet emission standards beyond certification and production stages, during actual operation and use. EPA is proposing to adopt an in-use testing program pursuant to the Agency's authority to implement and enforce the locomotive emissions standards, and pursuant to its authority to collect information from entities subject to the Act's requirements.

EPA believes that the best way to ensure that the in-use emissions reductions expected to result from implementation of today's proposed standards are actually achieved is to perform in-use testing on a number of locomotives every year. This is especially important in the absence of an upfront durability showing. The Agency is proposing an in-use compliance program with two distinct components. EPA is first proposing a program to be performed by the manufacturers and remanufacturers aimed primarily at testing locomotives from all engine families under the full FTP. Second, the Agency is proposing to require that Class I railroads annually test 10 percent of their locomotives which have met or exceeded their useful lives using a modified version of the FTP, as discussed in the test procedures section. The purpose of this second component is to assure that locomotive useful life periods are appropriate and to assure states that locomotives are continuing to meet applicable emissions

standards for the time period during which certain state standards are preempted beyond useful life, as described later in this notice. Each of these two components of the proposed in-use testing program are discussed in more detail in the following paragraphs.

The first major component of the proposed in-use testing program includes requirements that apply to manufacturers and remanufacturers. EPA is proposing to require manufacturers and remanufacturers to test emissions from in-use locomotives pursuant to its authority under section 208 of the Act. This provision applies to the locomotive and locomotive engine emissions standards as provided in section 213(d). Section 208 requires manufacturers to submit information and conduct tests that EPA may reasonably require to determine whether such manufacturer is in compliance with Title II of the Act and its implementing regulations, or to otherwise carry out the provisions of Title II. The proposed testing program is designed to minimize the burden on industry, while providing a strong incentive for manufacturers and remanufacturers to build engines that meet standards beyond the certification and production stages, when in actual use.

Under the proposed in-use testing scheme, manufacturers and remanufacturers will be required to test in-use locomotives from one engine family per year, using the full FTP. The Agency is proposing one engine family per year in order to limit the testing burden on manufacturers and remanufacturers. EPA will specify the engine family to be tested each year, with selection based on criteria such as production quantity, past emission performance (including performance in the proposed railroad test program), and engine and emission control technology. All in-use testing is proposed to be performed on locomotives, with no allowances for engine testing (except for engines used for repowering, and then only after locomotive testing has been performed). In order to limit the testing burden for small engine families, the in-use testing requirement would not apply to engine families with production of less than ten locomotives per year, except where there is evidence of in-use failures. EPA will provide manufacturers and remanufacturers suitable advance notice about which engine families are to be tested in any given year. EPA would have the authority to waive this in-use testing requirement for a given manufacturer or remanufacturer based on evidence of consistent in-use compliance. This waiver would not be available for a manufacturer or remanufacturer that has not yet demonstrated the durability of each of its engine families (i.e., has one or more engine families that have not been tested in-use), or if there is evidence, from railroad or other testing, that one of its engine families may not be complying in-use. EPA expects that after this program has been in place for several years, the in-use testing burden will be much smaller, as long as in-use failures were very infrequent.

The Agency is proposing that all locomotives tested under the manufacturer and remanufacturer in-use testing program will have reached at least 75 percent of their useful lives. While testing of locomotives will be limited to between 75 and 100 percent of their useful lives, actual repair in the event of a determination of noncompliance under section 207(c) of the Act, however, would not be limited by useful life. For example, compliance testing of an engine family might be limited to 75 to 100 percent of its useful life; however, any resulting remedy repair would be required to be applied to all locomotives of that family, regardless of whether the locomotives had exceeded their useful lives. This is consistent with EPA's recall policy for on-highway vehicles and engines and large compression-ignition nonroad engines.[15] Further, EPA proposes that it may require that any remedy in the event of a nonconformity extend to locomotives of the same engine family, but different model years, that were certified using the proposed certification carry over provisions. Such an extension of the remedy to other model years is proposed to be limited to two model years before and one model year after the model year of the nonconforming engine family. Such a provision would thus limit the liability in the event of a nonconformity to four model years' production.

Under EPA's proposed testing program, a manufacturer or remanufacturer would be required to test in-use locomotives from an engine family specified by EPA when that family reached an appropriate age. The Agency is proposing that an appropriate age to begin in-use testing would be 75 percent of a locomotive's useful life. EPA has chosen 75 percent of useful life in order to balance the need to accurately assess in-use emissions performance, which argues for testing late in useful life, with the desire to maximize the benefits of any remedial action in the event of an in-use failure, which argues for testing earlier in useful life. The in-use test program is intended to assess in-use emissions deterioration, not production quality (which is assessed in the production line testing program). Thus, it is most appropriate to test later in a locomotive's useful life, rather than earlier, to ensure that test results reflect actual in-use deterioration, which tends to increase with age. However, testing too late may present two problems. First, the later in useful life the testing is done, the more difficult it may be to find well-maintained locomotives to test, since many may be remanufactured before the end of useful life. Second, testing extremely late in useful life would minimize the benefits achieved from any remedial action taken in the event an in-use nonconformity is identified. Thus, EPA believes that testing at 75 percent of useful life strikes a balance between these different issues. EPA requests comment on whether a lower age or range (e.g., 50 to 75 percent of useful life) would be more appropriate for such testing, including commenters' reasons for suggesting different ages.

To achieve the Agency's goal of establishing a strong enforcement program while minimizing the burden on manufacturers, EPA is proposing a sampling process for the selection of locomotives for in-use testing which is designed to provide adequate data for the Agency to use as a basis for compliance decisions, while expediting testing of engine families found to emit below the standard. This proposed selection process to achieve this goal is described in the following paragraphs.

The number of locomotives of a targeted family to be tested by a manufacturer or remanufacturer would be determined by the following method:

1. A minimum of two locomotives per year for the specified family after it reaches the minimum age specified, provided that no locomotive fails any standard. For each failing locomotive, two more locomotives would be tested up to a maximum of 10 locomotives tested.

2. If the following conditions are met, only one locomotive per family per year must be tested: (1) The engine family has been previously tested under step 1 above; (2) the engine family has not changed significantly from the previously tested family (i.e., has been certified using carryover emission data); and (3) EPA has not informed the manufacturer of an emission concern with that family. If that locomotive fails for any pollutant, testing must be conducted as outlined in step 1 above, up to a maximum of ten locomotives.

[15] See Center for Auto Safety v. EPA, 747 F.2d 1 [D.C. Cir. 1984].

A manufacturer or remanufacturer could test more locomotives than the minimum above or could concede that the engine family failed to comply with applicable standards before reaching locomotive number 10. EPA would consider failure rates, average emission levels, and the existence of any defects in tested locomotives, among other things in determining whether to pursue remedial action. EPA may order a recall before testing reaches the maximum number of locomotives.

In EPA's motor vehicle compliance program, EPA determines the schedule for testing engine families and conducts the testing itself. EPA recognizes that it would reduce the burden of testing to afford maximum flexibility in determining the test schedules for in-use testing programs to locomotive manufacturers and remanufacturers so that such programs could be coordinated with the schedules of the railroads whose locomotives are to be tested (e.g., schedules for maintenance and safety inspections). For this reason, EPA is proposing to allow manufacturers and remanufacturers to set their own schedule for in-use testing. However, EPA could require that in-use tests be distributed throughout the year in order to prevent all testing for the year from being performed at times when the weather is most favorable for low emissions results.

The Agency recognizes that locomotive manufacturers and remanufacturers may have difficulty procuring locomotives for in-use testing due to the fact that they are in revenue-generating service. Therefore, EPA is proposing to allow manufacturers and remanufacturers twelve months after the receipt of testing notification to complete the testing of an engine family. (Testing by the Agency of an engine family in the motor vehicle program is usually completed within a three-month period.) The Agency believes that providing manufacturers and remanufacturers with twelve months to complete this testing provides them significant flexibility in conducting their test programs and adequately addresses any difficulties which would arise during the locomotive procurement and testing, and requests comment on this provision. Furthermore, the Agency is willing to consider extensions to this requirement when the manufacturers or remanufacturers present circumstances which warrant such extensions.

Test locomotives would be required to be randomly selected and to have a maintenance and use history representative of a properly maintained and operated locomotive. To comply with this requirement a manufacturer or remanufacturer would question the end user regarding the accumulated usage, maintenance and operating conditions of the test locomotive. Manufacturers or remanufacturers could, with EPA approval, delete locomotives from their test sample and replace them with others if they could document abuse or malmaintenance that might significantly affect emissions durability. The manufacturer or remanufacturer would document reasons for deletion in its test report to EPA. The manufacturer or remanufacturer may perform minimal maintenance on a test locomotive. One valid emission test conducted under the federal test procedure established for locomotives would be required for each selected locomotive.

EPA is proposing to require locomotive manufacturers and remanufacturers to submit to the Administrator, within three months of completion of testing, all emission testing results generated from the in-use testing program. EPA envisions that manufacturers and remanufacturers will simply provide quarterly statements of all emission results obtained during the previous quarter, including a summary table of any engine family that has completed testing during that quarter. At the Administrator's request, a manufacturer or remanufacturer would be required to provide documents used in the locomotive procurement process, including criteria used in the procurement screening process and information from the end user(s) related to use and maintenance of the selected locomotives, and information about locomotives, if any, that were deleted from the program.

If an in-use nonconformity is found to occur in an engine family, EPA will work with the manufacturer or remanufacturer to implement a remedial action on a voluntary basis. If the manufacturer or remanufacturer does not implement a remedial action, the Administrator may order one pursuant to section 207(c) of the Act. Under this section, as applied to locomotives according to section 213(d), the Administrator has authority to require manufacturers or remanufacturers to submit a plan to remedy applicable locomotives or locomotive engines if EPA determines that a substantial number of a class or category of properly maintained and used locomotives or locomotive engines do not conform with the requirements prescribed under section 213 of the Act. Other requirements applicable in the event of a determination under section 207(c) of the Act include submittal of the manufacturer's remedial plan for EPA approval, procedures for notification of locomotive owners, submittal of quarterly reports on the progress of the recall campaign, and procedures to be followed in the event that the manufacturer requests a public hearing to contest the Administrator's finding of nonconformity. If a determination of nonconformity with the requirements of section 207(c) of the Act is made, the manufacturer or remanufacturer would not have the option of an alternate remedial action, and an actual recall would be required.

EPA requests comment regarding the circumstances under which alternatives to conventional recall should be considered as a voluntary action, prior to EPA making the formal determination of nonconformity. EPA contemplates that recall of locomotives will be the primary method for addressing in-use nonconformities. However, the Agency recognizes that in some cases, the actual recall and repair of locomotives could impose severe financial hardship on a manufacturer or remanufacturer if the necessary repair was extremely complex and expensive, and could also impact railroads when locomotives are required to be taken out of service for those repairs. In such cases, and assuming that the Administrator had not yet rendered a determination of nonconformity, alternatives to traditional recall would be strongly considered. These alternatives would be required to have the same or greater environmental benefit as conventional recall and to provide equivalent incentives to manufacturers and remanufacturers to produce locomotives which durably and reliably control emissions. EPA requests comment on how manufacturers or remanufacturers who have repeated nonconformities should be handled as compared to those who have only occasional nonconformities. The Agency invites comment on the factors the Agency should consider in evaluating proposed alternatives.

EPA recognizes the need to develop a testing program to provide assurance that in-use locomotives are meeting emissions standards while taking into account the burden of in-use testing on railroads and locomotive manufacturers and remanufacturers. EPA requests comments on its proposed in-use testing program as well as specific proposals for in-use locomotive test schemes that will address the concerns described above, and possible alternative designs for in-use testing programs (such as independent third party testing paid for by manufacturers and/or remanufacturers) or other effective enforcement mechanisms. However, any

alternatives must produce a compliance scheme that provides EPA with an enforceable program which provides substantial incentive to manufacturers and remanufacturers to produce clean, durable locomotives.

EPA envisions the second major component of the proposed in-use compliance program, the railroad in-use test program, as a screening program whereby relatively large numbers of locomotives would be tested. Section 114 of the Act provides EPA authority to collect information, require records to be kept, and inspect and monitor emissions. Pursuant to its authority under this provision, EPA proposes an in-use testing program that applies to certain owners and operators of locomotives covered by the proposed emissions standards. Section 114 states, in relevant part, that, for the purposes of ''carrying out any provisions of (the Act),'' EPA may require any person who owns or operates any emission source to establish and maintain records, sample emissions (according to specifications prescribed by the Administrator), and to provide ''such other information as the Administrator may reasonably require.'' [16]

The proposed in-use testing program is necessary to ensure that locomotives will remain in reasonable compliance with emissions standards during the period of preemption beyond their useful lives in order to ensure that their emissions do not significantly increase during such period of preemption, when certain state standards would be prohibited. Railroad operators are clearly owners or operators of an emissions source, and therefore, pursuant to section 114, EPA has authority to require railroad operators to sample the emissions from their locomotives, to report the results of such testing to EPA, and to provide other information that can be reasonably required. In addition to providing authority to require such in-use testing, section 114 explicitly authorizes EPA to require that such testing be performed according to ''such procedures or methods, at such locations, at such interval, during such periods and in such manner as the Administrator shall prescribe.'' EPA solicits public comment on its authority to require railroad operators to conduct in-use testing according to the requirements specified below.

[16] An exemption from Section 114 authority is provided for carrying out provisions of Title II of the CAA with respect to manufacturers of new motor vehicles and new motor vehicles engines. The proposed in-use testing program would not impose any testing requirements on such manufacturers.

This railroad operator in-use testing program would be intended to evaluate the emissions performance of locomotives which have reached or exceeded their useful lives, as defined by federal regulations. The proposed railroad in-use testing program would apply at the end of useful life, where the manufacturer/remanufacturer in-use testing program leaves off. The data will serve to indirectly evaluate emissions performance at the end of useful life as well as provide information about emissions during the time period for which many state standards or requirements would be preempted because of their expected effect on how manufacturers and remanufacturers design new locomotives and new locomotive engines. The tests would be carried out on 10 percent of Class I railroad locomotives which have reached the end of their full useful lives each year. The number of tests a given railroad would have to perform for a given year would be determined based on the number of locomotives that railroad has that have reached the end of their useful lives at the beginning of that year. However, the actual locomotives tested would be randomly selected throughout the year from any that have reached the end of their useful lives, not necessarily only from those that were counted at the beginning of the year to determine the number of tests required (*i.e.,* they could include locomotives which reached the end of their useful lives during that year). EPA proposes that it have the authority to lower the number of tests required if the testing costs are substantially higher than EPA estimates or if the testing shows that in-use locomotives have consistently good emissions performance beyond their useful lives. Testing is proposed to be limited to Class I railroads because they operate most of the locomotives, and the costs to smaller railroads of conducting in-use tests would be very high and would likely provide information that merely duplicates that received from Class I railroads.

The locomotives tested would be randomly selected by the railroads, and the tests could be performed in conjunction with a Federal Railroad Administration inspection in order to minimize downtime. Testing of any locomotive will not take place until it has reached the end of its useful life. This is because the manufacturer and remanufacturer in-use testing program would provide for testing in-use locomotives up to the end of useful life. The testing, to be performed at all notches, would be done using field quality measurement equipment. NO_X, CO, CO_2 and HC concentrations are proposed to be measured, as well as smoke opacity. These concentrations will be compared to the concentrations measured during certification testing. EPA recognizes that effective HC measurement of diesel engine exhaust requires a heated flame ionization detector (HFID) as opposed to a standard, or unheated FID. Such units are more expensive and more difficult to maintain than unheated FIDs, making them less suitable for use as field quality equipment. The Agency is requesting comment on whether the requirement to use an HFID is problematic, and whether the requirement for HC measurement should therefore be dropped. If so, would this compromise the effectiveness of the in-use short test?

The Agency proposes that the railroads be required to submit quarterly reports summarizing all emissions testing performed. If a particular engine family had consistent problems in all the railroads' fleets then it would likely be considered a problem with the design or manufacture of the locomotives. Since the engines tested under this proposed program would be past their useful lives, no direct enforcement action could be taken against the manufacturer or remanufacturer in the event of a failure. However, EPA could use this information to target engine families to be tested in the manufacturer/remanufacturer in-use testing program. If the failures were limited to one railroad's fleet then it would suggest the possibility of tampering or malmaintenance, which could be enforceable under the tampering prohibition, discussed later in this notice.

The Agency is considering, as an option, an alternative in-use test program proposed by the railroads. Under this option, the railroads would perform testing using the full FTP (with the exception of PM measurement) instead of the test procedure described above. However, tests would be performed at a much lower sampling rate (e.g., one percent) than the ten percent the Agency is proposing. EPA requests comment on this alternative in-use testing scheme. EPA also requests comment on a second alternative whereby a smoke test would be used with the number of locomotives tested being much greater than the ten percent in the proposed railroad in-use testing program. EPA specifically requests comment on a program in which the Agency would require that every locomotive covered by today's proposed standards be tested annually by its

owner/operator for smoke emissions. Such a requirement would apply throughout a locomotive's useful life, as well as beyond it, in contrast to the previously discussed railroad testing programs, which only require testing after a locomotive has reached the end of its useful life. Under such a program, the railroads would be required to maintain the test result records and make them available to EPA upon request. Finally, EPA requests comment on combinations of the previously discussed options, as well as other alternative in-use testing schemes.

The Agency specifically requests comments on the merits of replacing the proposed two-component (i.e., manufacturer and railroad) in-use testing program with a unified program that is conducted entirely by the railroads. Such a program could potentially be significantly more convenient for all parties involved, especially for certificate holders that do not have their own emission testing facilities. On the other hand, such a program could be unreasonably burdensome to the railroads. Furthermore, manufacturers have historically been very skeptical of the quality of emission testing performed by third parties, and thus might challenge any EPA finding of nonconformity based on such data. Finally, if the Agency does not finalize a unified in-use testing program, should it create provisions that would specifically allow it to be adopted voluntarily by the railroads?

D. Test Procedures

Due to the fundamental similarity between the emissions components of locomotive engines and on-highway heavy-duty diesel engines, the test procedures being proposed today are based on the test procedures previously established for on-highway heavy-duty diesel engines in 40 CFR part 86 subparts D and N. Specifically, the raw sampling procedures and many of the instrument calibration procedures are based on subpart D, and the dilute particulate sampling procedures and general test procedures are based on subpart N. The most significant aspects of the proposed test procedures are described below. Also, as with EPA's test procedures for other engines, the regulations would allow, with advance EPA approval, alternate test procedures demonstrated to yield equivalent or superior results.

D.1. Federal Test Procedure (FTP) for Locomotives

EPA proposes to use a steady-state test procedure to measure gaseous and particulate emissions from locomotives; that is, a procedure wherein measurements of gaseous and particulate emissions are performed with the engine at a series of steady-state speed and load conditions. Measurement of smoke would be performed during both steady-state operations and during periods of engine accelerations between notches. Specifically, the engine would be started, if not already running, and warmed up to normal operating temperature in accordance with warm-up procedures for in-service locomotives as specified by the manufacturer. For locomotive testing, the engine would remain in the locomotive chassis, and the power output would be dissipated as heat from resistive load banks (internal or external). The engine would be considered to be warmed up, and ready for emissions testing when coolant and lubricant temperatures are approximately at the mid-points of the normal in-service operating temperatures for these materials as specified by the manufacturer. After the engine has reached normal operating temperature, the engine would be operated at full power (i.e., highest power notch) for 5 minutes, then returned to idle, or low idle if so equipped. The 5-minute period at full power is intended to ensure that the engine is at a realistic operating temperature, and to improve test repeatability. Measurement of exhaust emissions, fuel consumption, inlet and cooling air temperature, power output, etc. would then begin, and would continue through each higher power operating mode to maximum power. In the event of test equipment failure during data acquisition, testing may be resumed by repeating the last test mode for which valid data was collected, provided the engine is at normal operating temperature. The minimum duration of the initial test point (idle or low idle), and each test point when power is being increased is 6 minutes, with the exception of the maximum power point, where the minimum duration of operation is 15 minutes.

Concentrations of gaseous exhaust pollutants are proposed to be measured by drawing samples of the raw exhaust to chemical analyzers; a chemiluminescence analyzer for NO_X, a heated flame ionization detector (HFID) for HC, and nondispersive infrared (NDIR) detector for CO and CO_2. Smoke would be measured with a smoke opacity meter, and particulates would be measured by drawing a diluted sample of the exhaust through a filter and weighing the mass of particulate collected. The Agency is not proposing to establish dilute sampling procedures for the total exhaust stream for gaseous and particulate emissions because it is not necessary to dilute the total exhaust stream prior to sampling for HC, CO_2, CO, NO_X, and particulate during steady state operations. In addition, the equipment that would be required for dilute sampling is very large and expensive. Not including such provisions would not preclude the use of dilute sampling as an alternative procedure. EPA requests comments regarding the need for dilute sampling procedures. In order to ensure good reliability of test results, EPA is also proposing calibration and verification requirements similar to those applicable to on-highway heavy-duty engines, and requests comments regarding the proposed methods and frequency of these requirements. It should also be noted that the Agency is in the process of making minor technical revisions to the particulate measurement procedures of 40 CFR 86, and that many of these technical amendments would be relevant to measurement of particulate emissions from locomotives. These amendments are expected to be finalized later this year. The Agency will incorporate these changes in the final rule for locomotives, as appropriate.

The Agency is proposing that the NMHC, alcohol and aldehyde measurement procedures that are currently applicable to on-highway natural gas- and methanol-fueled engines (40 CFR part 86) be used for natural gas- and alcohol-fueled locomotives. EPA recognizes, however, the possibility of unforeseen problems that could result during the use of such procedures with locomotive engines, especially with alcohol-fueled locomotives (which currently do not exist). Among the potential problems are the lack of information on whether the specifications for dilute alcohol and aldehyde sample temperatures and flow rates are appropriate for locomotives, as well as the complete lack of such specifications for raw exhaust. At this time, EPA believes that it is appropriate to specify the on-highway procedures in the absence of definitiveness of potential problems, but may reconsider alcohol and aldehyde sampling issues on a case-by-case basis, should alcohol-fueled locomotives come into use.

EPA's experience in testing engines is that it is difficult to accurately measure engine power at extremely low levels. Thus, EPA is considering, and requests comment on, assigning engine power levels for idle and dynamic brake

modes, expressed as a percent of the locomotive's rated power (*e.g.*, 0.2% at idle and 1.0% at dynamic brake), and not requiring that it be measured. These assigned levels, rather than measured levels, would be used in the emissions calculations. This approach would alleviate concerns expressed by industry about the ability to accurately measure engine power output during idle and dynamic brake operation. This would also provide a regulatory incentive to reduce fuel consumption in these two modes since the engine power used in the calculations for these modes would always be the same. This would in turn reduce total mass emissions. EPA requests comment on all aspects of this option, including what levels would be appropriate for the assigned power levels. The Agency also requests comments as to whether a similar approach should be used to provide an incentive for the development of an automatic shutdown mechanism that could shut off an engine automatically after some extended period of idling. One such approach would be to reduce the weighting factor for the idle *emission rate*, for engines equipped with automatic shutdown mechanisms, but use the higher *power* weighting factor that is specified in the proposed regulations. This approach would account for the emissions benefits of a shutdown mechanism whereas the proposed test procedures do not.

EPA is proposing that test conditions such as ambient test temperature and pressure be fully representative of in-use conditions. Specifically, the Agency is proposing that locomotives comply with emissions standards when tested at temperatures from 45° F to 105° F and at both sea level and high altitude conditions (*i.e.*, up to 7,000 feet above sea level). The Agency is not proposing that the test conditions include temperatures below 45° F because the Agency does not believe that there are significant benefits from such a requirement for diesel locomotives as compared to the benefits from controlling cold temperature emissions from gasoline-fueled vehicles (where EPA does currently have cold temperature requirements) since diesel engines are not associated with low temperature emissions problems.

The Agency is not proposing specific correction factors that would be used to account for the effects of ambient test conditions, such as temperature or humidity, on emission rates. In existing mobile source programs, EPA does require that NO_X emission rates be corrected to account for the effect of ambient humidity. (Water present in the intake air is known to lead to lower NO_X emissions, as it absorbs energy from the combustion process and decreases peak combustion temperatures.) EPA considered using the NO_X-humidity correction factor that is currently being used for highway and general nonroad diesel engines (40 CFR parts 86 and 89), but concluded that the data upon which that correction factor was based is not adequate for this rulemaking. In particular, EPA has concerns about the applicability of data from older pre-control highway engines to current and future locomotives that incorporate NO_X-reduction technologies. More importantly, however, the data is inappropriate as a basis for such correction factors for locomotives because the range of test conditions being proposed for locomotives is much broader than was used in the collection of that data. EPA is in the process of developing revised correction factors for inclusion in the final rule and will place any relevant information in the docket as soon as it is available. These would be used to correct emission rates to typical ambient summer conditions of 86 °F and 60 grains of water per pound of dry air. EPA requests comments on the need for any correction factors, especially a NO_X correction factor, and whether proposed the conditions to which emissions would be corrected are appropriate. Commenters supporting the use of correction factors are encouraged to include test data that could be used to develop meaningful correction factors for future locomotives.

The Agency is proposing test fuel specifications for compliance testing (certification, PLT and manufacturer/remanufacturer in-use testing) which are consistent with test fuel specifications for on-highway heavy-duty engine certification testing, with the exception of the sulfur specification. In the case of the sulfur specification, EPA is proposing a lower limit of 0.3 weight percent,[17] and is proposing that there be no upper bound for the sulfur level. This lower limit is intended to approximate worst case in-use conditions; in those cases where in-use locomotives are operated on low sulfur on-highway fuel, particulate emissions entering the atmosphere can be expected to be lower than levels measured when using the certification test fuel. EPA is taking this approach because there is no reason to believe that in-use locomotives will use only low sulfur on-highway fuel, especially given the potential price differences between low and high sulfur diesel fuels, and potential availability problems in some areas of the country.

Since the proposed test for the railroad in-use testing program is not the proposed FTP, and railroad in-use testing carries no liability with it, there is less of a need to use the fuel specified for certification for this railroad in-use testing. Given the cost and inconvenience of using a specific fuel for in-use testing, EPA is not proposing any fuel specifications for in-use railroad testing, and will allow the railroad testing to be done whatever fuel is in the locomotive's tank at the time of testing.

The Agency recognizes that the potential exists for future locomotives to include additional power notches, or even continuously variable throttles, and is proposing alternate testing requirements for such locomotives. Using the proposed FTP for such locomotives would result in an emissions measurement that does not accurately reflect their in-use emissions performance because it would not be a reasonable representation of their in-use operation. Thus, locomotives having additional notches would be tested at each notch, and the mass emission rates for the additional notches would be averaged with the nearest ''standard'' notch. Locomotives having continuously variable throttles would be tested at idle, dynamic brake, and 15 power levels assigned by the Administrator (including full power), with average emission rates for two power levels (excluding full power) assigned to the nearest ''standard'' notch. The 15 power levels proposed represent one level for full power and two, to be averaged, for each of the seven intermediate power levels used on current locomotives. The Administrator would retain the authority to prescribe other procedures for alternate throttle/power configurations.

D.2. FTP for Engines

The proposed test procedures are intended primarily for the testing of locomotives, rather than locomotive engines. However, EPA does recognize that engine testing will be reasonable in some cases, such as data collection from a development engine. For these cases, the engine would be mounted on a stand, with its crankshaft attached to an electric dynamometer. Because the Agency believes that it is critical that engine testing be as representative of actual locomotive operation as can practically be achieved, it is proposing that important operating conditions such as engine speed, engine load, and the temperature of the charge air

[17] Typical untreated (high sulfur) nonroad diesel fuel contains about 0.2–0.5 weight percent sulfur.

entering the cylinder be the same as in a locomotive in use (within a reasonable tolerance limit).

D.3. Short Test for Locomotives

The Agency is also proposing a short test to be used by the railroads for in-use testing. This test procedure would be similar to the FTP test, but would not require measurement of the fuel flow rate and engine power output (which require mechanical work on the locomotive), or particulate emissions (which requires a fairly expensive sampling system). Also, less precise analytical equipment would be allowed. These allowances are all included to minimize testing time and cost. This test would not allow direct calculation of the mass emission rates, but rather, would be limited to measurement of concentrations which would be compared to concentration measurements made during certification testing. If the fuel flow rate and power output of the engine are both assumed to be the same as measured at certification, however, approximate mass emission rates could be determined.

E. Railroad Requirements

Historically, EPA has not adopted specific federal requirements for end users of regulated mobile source engines and vehicles. However, there are some factors unique to the railroad industry and to the proposed regulation of locomotives that require the railroads to take a more active role in assuring compliance with today's proposed standards. These characteristics include the proposed broad preemption of state regulation, the industry practice of periodically remanufacturing locomotives and the proposed definition of such locomotives as new, and the unique relationship between the locomotive manufacturers and the railroads.

As discussed in the section on compliance, EPA is proposing two in-use testing programs for locomotives: one conducted by manufacturers and remanufacturers, and another conducted by railroads. For the first program, manufacturers and remanufacturers would need to obtain test locomotives from the railroads. EPA expects that the railroads will cooperate with the manufacturers in order to provide locomotives for this testing. The Agency recognizes that the railroads have a strong financial interest in keeping their locomotives in revenue service and minimizing scheduling disruptions, and that this could make it difficult for manufacturers to procure locomotives for in-use testing. Thus, as was mentioned in the in-use testing program discussion, EPA is proposing a relatively long period of time in which the in-use testing can be done, as well as a fairly small number of locomotives required to be tested, in order to minimize such disruptions. EPA expects the railroads to provide reasonable assistance to the manufacturers and remanufacturers in support of the in-use testing program. However, if a manufacturer or remanufacturer is unable to obtain a sufficient number of locomotives for testing, the Agency may require that the railroads do the testing themselves, under the authority of section 114 of the Act. In the second program, the railroads will be required to conduct their own in-use testing, as discussed above in the section on in-use testing programs.

EPA is proposing additional provisions to avoid unnecessary burdens on smaller railroads. First, the in-use testing requirement would apply only to Class I railroads. The potential benefits of obtaining extensive in-use test data from non-Class I railroads do not justify the costs that would be incurred if each railroad was required to maintain an emissions testing facility, especially in light of the fact that the information provided by the non-Class I railroads would be duplicative of that provided by the Class I railroads. EPA is also proposing to exempt the smallest railroads (as defined later in the paragraph) from compliance with the Tier 0 standards for locomotives that have never been brought into compliance. More specifically, these railroads would be allowed to rebuild their existing locomotives and locomotives that they purchased after the effective date of the Tier 0 standards according to their current practice, provided such locomotives were not originally manufactured or previously remanufactured to comply with federal emission standards. This exemption would allow these railroads to avoid the costs of converting a pre-existing, noncomplying locomotive into one which complies with the Tier 0 standards. All locomotives already certified to the Tier 0 standards, either by that railroad or a previous owner, would be required to remain in compliance with EPA regulations each subsequent time that they are remanufactured, since this would be much less expensive than converting a noncomplying locomotive into one which complies with the Tier 0 standards. As is discussed in the RSD, the cost of remanufacturing a locomotive so that it complies with the Tier 0 standards is much greater the first time it is brought into compliance as compared to subsequent remanufactures due to the one-time costs associated with the installation of such things as charge air cooling systems. The Agency believes that such an exemption is appropriate since the emissions impact of such an exemption would be minimal. As discussed in the RSD, such an exemption would likely amount to less than one percent of emissions initially, and would decrease and eventually disappear as the fleet turns over to Tier I and Tier II locomotives. EPA is proposing that this exemption would be limited to railroads that have 500 or fewer employees and are not owned by companies that the Small Business Administration would not classify as small businesses, and requests comments as to whether this criteria is appropriate, and whether some other criterion, such as annual revenue, should be used. The Agency requests comment on how it should treat holding companies which own small railroads with respect to this exemption. All railroads taking advantage of this exemption would also be exempted from the reporting requirements listed above. The Agency requests comment on how such exempted locomotives should be treated with respect to the preemption of certain state standards or requirements, as discussed later in the preemption section.

EPA is proposing that any locomotive operator that knowingly fails to properly maintain (as defined by EPA at the time of certification) a locomotive subject to this regulation would be subject to civil penalties for tampering. EPA is proposing that locomotive operators should be required to perform a minimum amount of maintenance specified by manufacturers and remanufacturers for components that critically affect emissions performance. EPA is proposing to limit the frequency and type of maintenance that could be required by manufacturers and remanufacturers, and to make such requirements subject to the Administrator's approval. Examples of the type of maintenance that could be required are replacement of fuel injectors and air filters, and cleaning of turbochargers. The Agency believes that this requirement is appropriate given the high standards of maintenance and repair observed in the railroad industry, the reasonable expectation by locomotive manufacturers and remanufacturers that this maintenance will be done, and the importance of such maintenance for ensuring proper emissions performance.

The Agency recognizes that, while many railroads own the locomotives that they operate, there is also a substantial amount of leasing of locomotives within the railroad industry. The Agency is proposing that the railroad requirements described in this section apply to the railroads (i.e., the locomotive operators), but requests comment on whether these requirements would more appropriately be applied to the locomotive owners in cases where the owner an operator are not the same entity.

F. Miscellaneous

F.1. Liability for Remanufactured Locomotives and Locomotive Engines

As was previously discussed in the engine family certification section, EPA expects that in some cases locomotives and locomotive engines may be remanufactured using a remanufacture kit that was developed and manufactured by one entity but installed by another. In these cases, it is most likely that the kit manufacturer will be the certificate holder.[18] For example, one of the primary locomotive manufacturers could sell a remanufacture kit (to possibly include a collection of replacement parts or parts specifications, along with installation and maintenance instructions) to a railroad that would use it to remanufacture one of its locomotive engines. EPA believes it is critical to clearly define which entity would then be liable for the emissions performance of that remanufactured locomotive engine. As a starting point, the Agency considered how it handles the installation of aftermarket alternative fuel conversion systems for on-highway vehicles.[19] With such conversions, EPA holds the certificate holder liable for the in-use performance of the vehicles. EPA is proposing a similar presumptive liability approach for locomotive remanufacturing. Specifically, EPA is proposing that the primary liability for the in-use emissions performance of a remanufactured locomotive or locomotive engine would be with the certificate holder. In cases where the certificate holder and installer are separate entities, the certificate holder would be required to provide adequate installation instructions with the kit. Since the primary liability would be presumed to apply to the certificate holder, the certificate holder would also have an incentive to ensure that the kits were being properly installed. Ultimately, the installer would be liable for improper installation under the proposed tampering prohibitions. It should be noted that such an installer would still be considered to be a remanufacturer, and thus would also be potentially liable under other provisions of this part and of the Act. The Agency requests comment on this proposed liability scheme for remanufactured locomotives and locomotive engines.

F.2. Defect Reporting

EPA is proposing that a manufacturer or remanufacturer of locomotives or locomotive engines be required to file a defect information report whenever the manufacturer or remanufacturer identifies the existence of a specific emission-related defect in a locomotive, or locomotive engine. These proposed reporting requirements are similar in structure to the requirements found in the on-highway and nonroad over 37 kW programs for compression ignition engines,[20] except that EPA proposes that a report be filed when a single locomotive, rather than 25 (as in the on-highway and over 37 kW programs) is found to be defective. During the rulemaking in which the defect reporting requirements (including the threshold of 25) were adopted for on-highway vehicles and engines (42 FR 28123), the Agency considered a lower threshold, but decided that it would be too burdensome. However, there are three reasons why a lower threshold would be appropriate for locomotives. First, since reliability is a very critical concern for locomotive purchasers, locomotives and locomotive engines tend to be very carefully manufactured. As such, the number of emission-related defects that would actually occur is expected to be small. Second, the number of locomotives produced under a single certificate will be much smaller for locomotives than for most on-highway or nonroad engine families. While 25 would be a very small fraction of a light-duty engine family of 100,000 vehicles, it could be one-quarter or more of the annual production volume of a locomotive engine family. Finally, given the size of locomotive engines (30 to 40 times the horsepower of a typical light-duty vehicle), and their long service lives (up to one million miles between rebuilds), the environmental impact of even a single defective engine could easily be much more significant than 25 defective light-duty vehicles.

F.3. Importation of Nonconforming Locomotives

EPA is proposing to prohibit the importation of locomotives and locomotive engines that are originally manufactured after the effective date of this rule, but are not covered by a certificate of conformity, except as provided below. The proposed prohibition is similar to existing regulations for the importation of nonconforming motor vehicles, motor vehicle engines (on-highway program), large (over 37 kW) compression-ignition nonroad engines and other regulated mobile sources.

Under EPA's current motor vehicle regulations, Independent Commercial Importers (ICIs) are allowed to import uncertified vehicles and engines into the U.S. but are required to comply with the same requirements that are applicable to motor vehicle manufacturers (*e.g.*, certification, testing, labeling, warranty, recall, maintaining records). EPA provides for an ICI program for motor vehicles and motor vehicle engines because significant importation of such vehicles and engines occurs. EPA does not anticipate, however, any importation of nonconforming locomotives and locomotive engines. Therefore, an ICI program is not necessary for locomotives or locomotive engines, and EPA is not proposing such a program.

This proposal includes certain exemptions to the prohibition on importing nonconforming locomotives and locomotive engines under the authority of section 203(b) of the Act. These include temporary importation exemptions for repairs and alterations, testing, precertification, display, national security, and certain locomotives and locomotive engines shown to be identical, in all material respects, to their corresponding United States certified versions. In previous rulemakings, EPA has provided for an exemption for motor vehicles and engines greater than 20 original production years old. However, EPA is not proposing a similar exemption for locomotives and locomotive engines. Since it is normal industry practice for locomotives to be in service for more than 40 years, these older locomotives constitute a large fraction of the in-use fleet, much larger than do motor vehicles over 20 years old. The Agency is proposing emission standards that will apply to all locomotives originally manufactured on or after January 1, 1973 when those locomotives and locomotive engines are remanufactured, including those more than 20 original production years old. It would be

[18] For the purposes of this discussion, EPA is proposing that the certificate holder for a remanufacture kit be termed the remanufacturer. The entity which installs the remanufacture kit would be termed the installer. The remanufacturer can also be the installer.

[19] 59 FR 48472, Sept. 21, 1994 and 59 FR 50042, Sept. 30, 1994.

[20] 40 CFR part 89, subpart T.

inappropriate for EPA to allow the importation of nonconforming locomotives simply because they are more than 20 years old. EPA requests comment on the absence of such an exemption.

Importation regulations are issued by both EPA and the United States Department of the Treasury (Customs Service). The citation for United States Customs Service, Department of Treasury regulations governing import requirements is reserved. The citation will be inserted upon promulgation by the United States Customs Service of the applicable regulations.

F.4. Tampering

EPA is proposing provisions that would prohibit any person from tampering with any locomotive or locomotive engine emission-related component or system installed on or in a locomotive or locomotive engine in accordance with EPA regulations. These provisions would help ensure that in-use locomotive engines remain in certified configurations and continue to comply with the applicable emission standards. All persons would be prohibited from removing or rendering inoperative any emission-related device or element of design installed on or in a locomotive or locomotive engine. These provisions would include a prohibition on the adjustment of engine parameters such as injection timing outside of the specified ranges. Knowingly failing to maintain emissions-critical components would also be considered tampering. The manufacturing, sale, and installation of a component intended for use with a locomotive or locomotive engine, where a principal effect of the component is to bypass, defeat, or render inoperative an emission-related device or element of design of the locomotive or locomotive engine would also be prohibited.

EPA expects that the implementation of these provisions would be generally similar to the implementation of existing on-highway tampering provisions.[21] The prohibition of tampering would extend beyond a locomotive's useful life, until the locomotive or engine is scrapped. The prohibition on tampering would begin once a locomotive becomes subject to today's proposed regulations, either by being freshly manufactured or by being remanufactured. Thus, any replacement of parts (including complete rebuilds) which cause a locomotive to exceed applicable standards or FELS, or any adjustments to the engine outside of the range specified in the application for certification (such as changing injection timing) would be considered tampering even if performed beyond the locomotive's useful life.

F.5. Nonconformance Penalties

Pursuant to section 206(g)(1) of the CAA, the on-highway heavy-duty engine emission compliance program provides that, in certain cases, engine manufacturers whose engines cannot meet emission standards may receive a certificate of conformity and continue to sell their engines provided they pay a nonconformance penalty (NCP). EPA has concluded that the use of NCPs is not warranted for locomotives and locomotive engines. NCPs are designed to provide relief for engine manufacturers who are technology developing laggards in the emission control technology needed to meet technology forcing standards.[22] Based on the levels of the standards proposed in this NPRM, EPA has concluded that there will be no locomotive or locomotive engine manufacturers or remanufacturers that are unable to develop the necessary emission control technology to bring their locomotives and locomotive engines into emission compliance. Thus, the Agency is not proposing any NCPs. EPA requests comment on the possibility of there being a manufacturer or remanufacturer that would be unable to comply with the proposed standards.

F.6. Emission Warranty

EPA is proposing an emission warranty period for all locomotive and locomotive engine emission-related parts equivalent to the full useful life of the locomotive or locomotive engine. Specifically, the manufacturer or remanufacturer must warrant that the locomotive, locomotive engine, or remanufacture kit is designed, built and equipped to conform, at the time of sale or time of return to service following remanufacture, with all applicable regulations, and that it is free from defects that would cause nonconformity in use. The warranty is not required, however, to cover normal maintenance such as cleaning or replacing fuel injectors. EPA requests comment on how to treat the unscheduled maintenance of other components, such as power assemblies or turbochargers, that are often replaced during the useful life of a locomotive. These warranty provisions are authorized by section 207(a) of the Act, which applies to the locomotive standards pursuant to section 213(d). EPA is not proposing any regulations at this time under section 207(b) of the Act, which directs EPA to establish special test procedures for on-highway vehicles and engine, if certain conditions are met, to ascertain whether vehicles and engines comply with applicable federal emissions standards for their useful life. If the Agency were to establish test procedures under this provisions, manufacturers would be required to warrant that their vehicles and engines would pass such tests. Furthermore, EPA believes that states would not be preempted from establishing an in-use emissions testing program for locomotives based on the performance warranty provisions of section 207, provided that it used federally-specified test procedures and pass/fail criteria. In such a situation, compliance with the performance warranty based on state testing would in effect be a federal requirement.

While a shorter warranty period may be adequate to ensure gross failures to performance systems and components do not occur, longer warranty periods are necessary to guard against emission control system failures. The warranty period must be of sufficient length to give the manufacturer or remanufacturer proper incentive to provide durable emission control equipment. EPA requests comments on the appropriateness of the length of the warranty period. The proposed warranty periods ensure the locomotive or locomotive engine manufacturer or remanufacturer has sufficient incentive to build emission-related systems that work and last. Further, it gives the locomotive or locomotive engine owner/operator the incentive to get emission-related system failures repaired, since failures to the emission control system might not always affect the ability of a locomotive or locomotive engine to continue to work. Should the warranty period be too short, a large number of noncomplying locomotives and locomotive engines could continue to produce excess emissions. EPA requests comment on how it should integrate these warranty provisions with the proposed required maintenance provisions.

An advisory parts list issued by EPA on July 15, 1991 gives manufacturers notice of EPA's current view concerning the emission-related parts that are covered by warranty under section 207(a). Given the similarity between the basic design of locomotive engines with that of other diesel engines, EPA intends to apply an updated version of this list to locomotives and locomotive engines.

[21] Office of Enforcement and General Counsel; Mobile Source Enforcement Memorandum No. 1A, June 25, 1974.

[22] See 40 CFR 86.1103–87.

A copy of this list is in the docket for this rulemaking.

F.7. Locomotives From Canada and Mexico

This proposal applies to new locomotives and locomotive engines which are sold or introduced into commerce in the United States. The Agency is concerned about the possibility of nonconforming locomotives from Canada and/or Mexico operating extensively within the U.S., under the ownership of either a U.S. or foreign railroad. EPA requests comment on EPA's legal authority to limit such activity. Comments should address whether EPA should limit export exemptions of nonconforming locomotives, since locomotives used in Canada and Mexico are often produced in the U.S, and whether the Agency would have the authority to do so. EPA is also seeking to address this issue with the North American Automotive Standards Council by exploring the potential for Canada and Mexico to adopt the same emissions standards for locomotives that EPA ultimately adopts. The Agency believes that the most effective solution to this potential problem would be for the Canadian and Mexican governments to adopt comparable (or identical) standards and other requirements for locomotives.

F.8. Aftermarket Parts

As is the case for on-highway vehicles and engines, there is currently an aftermarket parts market for locomotive parts. For on-highway vehicles and engines, the Agency currently has a two-fold approach to assuring that aftermarket parts do not degrade the emissions performance of a certified vehicle or engine configuration. First, there is a voluntary aftermarket parts certification procedure contained in 40 CFR part 85, subpart V, which allows aftermarket parts manufacturers to certify the emissions performance of their parts. Second, for those parts which are not certified under this voluntary program the Agency applies the principles of EPA Mobile Source Enforcement Memorandum No. 1A, which outlines the Agency's position on tampering with respect to the use of replacement components on certified vehicles and engines.[23] EPA is proposing that this approach to aftermarket parts be extended to locomotive parts as well, and requests comment on whether this approach is sufficient to assure the proper emissions performance of locomotives which utilize aftermarket parts.

The Agency is also requesting comments on whether it should establish provisions that would allow suppliers of aftermarket parts and parts remanufacturers to sell some emission-related parts for locomotive remanufacturing without being part of a certified remanufacture kit. Such provisions could create an exemption which would allow Class II and Class III railroads to have their locomotives remanufactured without a certificate of compliance, provided that the remanufacture resulted in the locomotive being returned to a previously certified configuration. If EPA were to establish such an allowance, should it limit it based on the size of the railroad, the size of the supplier or remanufacturer, or the number of such remanufactures performed annually? What, if any, reporting and recordkeeping requirements would be necessary to ensure compliance with the provisions? Finally, what would be the economic and environmental impacts of such provisions? EPA also requests comment on a streamlined certification program for modified kits. Such a program would allow an entity to apply for a modified certificate which would allow the use of parts other than those included in a certified kit. Such a certificate would only be granted with the permission of the original certificate holder, and the holder of the modified certificate would then assume all liability for locomotives remanufactured under the modified certificate. EPA requests comment on this and any other options for the streamlined certification of remanufactured locomotives.

F.9. Onboard Diagnostics

EPA has recently established regulations[24] that require light-duty vehicles to be equipped with onboard diagnostic (OBD) systems that indicate to the operator any occurrence of specific emission control failures. While EPA has not included any such provisions in the regulations being proposed today, it is requesting comment on the potential and need for such diagnostics for locomotives. EPA believes that it would be inappropriate to require that such systems be retrofitted to existing locomotives due to the cost, but that it may be appropriate to require them on freshly manufactured locomotives (Tier I and Tier II), which are expected to have advanced onboard computer displays for other purposes. Commenters are encourage to address the following issues, as well as any other relevant issues: (1) The extent to which easily measured parameters such as engine exhaust temperature or pressure drop across an air filter correlate with emissions performance; (2) the feasibility of monitoring injection timing; (3) how such OBD systems should be considered with respect to required maintenance; and (4) the extent to which advanced OBD systems affect the appropriate frequency of in-use testing.

G. Preemption

EPA is proposing to define through regulation those state or local standards or requirements that are preempted pursuant to section 209(e)(1)(B) of the Clean Air Act. Section 209(e) directs EPA to promulgate regulations to implement that subsection. To implement section 209(e), and specifically section 209(e)(1)(B), it is appropriate for EPA to interpret these provisions in light of other provisions in the statute as well as relevant case law and circumstances specific to locomotives. EPA believes that establishing regulations to define the scope of preemption under section 209(e)(1)(B) and providing EPA's interpretation of the statute and implementing regulation would provide clear guidelines to states,[25] and certainty to industry. EPA believes that because of the interstate nature of locomotive travel and the fact that regulation of locomotives is generally national in scope, it is especially important to provide clarity and certainty to the industry and states regarding preemption of state and local emission control regulation of locomotives.

Under the regulations proposed today, states would be preempted from adopting and enforcing standards or other requirements relating to the control of emissions from new locomotives and new engines used in locomotives. The proposed regulation defines the period of time following the manufacture or remanufacture of a locomotive or engine during which certain state controls would be explicitly preempted under this criteria. This preemption period would be defined as the useful life plus 25 percent. EPA's rationale for choosing this preemption period is described later in this section.

EPA believes that section 209(e)(1)(B) and the regulations proposed today would preempt states from adopting in-use regulations relating to the control of emissions that would be expected to

[23] June 25, 1974. Available in the public docket for this rulemaking.

[24] 40 CFR 86.094–17

[25] The term ''states'' when used in this section includes both state and local governments.

affect how a manufacturer designs a new locomotive or new locomotive engine (including both freshly manufactured and remanufactured units).[26] Such state regulation would be considered as ''relating to the control of emissions from (new locomotives or locomotive engines)'' and would be preempted. This interpretation appropriately implements Congressional intent, in the unique circumstances applicable to locomotives. It is also consistent with the case law interpreting a similar provision that applies to state motor vehicle controls.

In *Allway Taxi* v. *City of New York* [27], the court discussed the scope of federal preemption under section 209(a), which prohibits state or local standards relating to the control of emissions from new motor vehicles, and noted that the definition of ''new motor vehicle'' in section 216 of the Clean Air Act ''reveals a clear Congressional intent to preclude states and localities from setting their own exhaust emission control standards only with respect to the manufacture and distribution of new automobiles.'' [28] The court concluded that while Congress did not preempt states from regulating the use or movement of motor vehicles after they are no longer new, a state or locality is not free to impose its own emission control standards on motor vehicles that are no longer new where that would circumvent the Congressional purpose of preventing obstruction to interstate commerce.

In an earlier rulemaking action, EPA discussed the application of the *Allway Taxi* case to non-road vehicles and engines other than locomotives, and stated that the Agency expected the principles of *Allway Taxi* to apply to state adoption of emission controls on non-road vehicles and engines after they are no longer new. See 59 FR 36969, 36973 (July 20, 1994). In that notice, EPA stated that the Agency expected the same reasoning and policy would also apply to locomotives, although the implementation of that policy would depend on the ultimate definition of ''new locomotive.'' EPA today proposes to apply the same principles to state regulation of emissions from locomotives; however, because of compelling factual and policy considerations relating to regulation of locomotives as compared to regulation of motor vehicles and other nonroad vehicles and engines, the implementation of these principles would be expected to differ to a significant degree.

In the context of motor vehicle regulation, the *Allway Taxi* court noted that a state's imposition of its own emission control requirements immediately after a new motor vehicle is purchased by an ultimate consumer and registered would be ''an obvious circumvention of the Clean Air Act and would defeat the Congressional purpose (in preempting states from regulating emissions from new motor vehicles) of preventing obstruction to interstate commerce.'' [29] However, states may impose emission control standards after some period of time following the sale of a motor vehicle, provided that those standards would not require a vehicle manufacturer to redesign a new motor vehicle. The court stated that such requirements, such as standards directed primarily at intrastate activities where the burden of compliance does not effectively impact manufacturers and distributors, cause only minimal interference with interstate commerce. [30]

Applying this analysis to state regulation of locomotives, section 209(e)(1)(B) and the regulations proposed today would preempt states from adopting in-use regulations relating to the control of emissions that would be expected to affect how a manufacturer designs a new locomotive or new locomotive engine (including both freshly manufactured and remanufactured engines). Such a state standard would be considered as ''relating to the control of emissions from [new locomotives or locomotive engines]'' and would be preempted. The practical effect of applying the principles of *Allway Taxi* to locomotives is different than for other mobile sources because of the nature of the relationship between locomotive manufacturers and their customers (railroad operators). Emission related requirements imposed on railroads can reasonably be expected to have a very significant effect on locomotive manufacturers and remanufacturers. This is especially true of the Class I railroads which purchase nearly all of the freshly manufactured locomotives. With so few primary customers, manufacturers and remanufacturers must be very responsive to changes in design requested by these railroads. Although there are significantly more non-Class I railroads than there are Class I railroads, their number is still fairly small. Therefore, state requirements on railroads are much more likely to effect changes in how manufacturers and remanufacturers design new locomotives and new locomotive engines than would similar requirements on end users of other mobile sources, such as automobile owners. The fact that locomotive engines become new again when they are remanufactured will also have an effect on how the principles of *Allway Taxi* are applied. EPA solicits comment on this interpretation of *Allway Taxi* as applied to locomotive regulation.

In addition to the unique factual circumstances surrounding locomotives, there are compelling policy reasons that support uniform, national regulation of locomotive emissions. The legislative history of section 209(e) indicates that Congress intended a broad preemption of any state regulation of emissions from new locomotives or new locomotive engines, in large part because of the significant interstate commerce concerns raised by state-by-state regulation of locomotives. The House bill would have preempted states from regulating emissions from all new nonroad engines and vehicles.[31] By contrast, the Senate bill contained no preemption of state regulation of nonroad engines.[32] In conference, the House and Senate agreed to limit the House bill's broad preemption, and prohibited state standards and other requirements for only two categories of nonroad vehicles and engines: new farm and construction equipment of 175 hp or less, and new locomotives.[33] The following statement made by Rep. Dingell during the House debate on the Senate bill indicates Congress' concern that state regulation of locomotives in particular could result in a disruption of interstate commerce:

> With regard to (new locomotives and new engines used in locomotives), we balanced the need to control emissions from new locomotives against our belief that State efforts to regulate locomotive emissions or operations would impose an unconstitutional burden on interstate commerce.[34]

The legislative history of section 209(e) does not contain a similar statement regarding any other category of nonroad vehicles, indicating

[26] The proposed approach is intended to address real and concrete effects, whether or not large; however, it is not intended to address speculative or trivial effects.

[27] *Allway Taxi, Inc.* v. *City of New York*, 340 F.Supp. 1120 (S.D.N.Y.), aff'd, 468 F.2d. 624 (2d. Cir. 1972).

[28] 340 F.Supp. at 1124.

[29] *Id.*

[30] *Id.*

[31] 2 *A Legislative History of the 1990 Clean Air Act Amendments of 1990* at 3092 (1993).

[32] 3 *A Legislative History of the Clean Air Act Amendments of 1990* at 4370 (1993).

[33] California was permitted to promulgate and enforce state standards and other requirements for other nonroad engines, if it received authorization from EPA. Other states could then promulgate standards identical to California's for these other engines.

[34] 1 *Legislative History of Clean Air Act Amendments of 1990* at 1126 (1993).

Congress' specific concern with the interstate commerce burden that could result from state regulation of new locomotives. Therefore, EPA believes that it is appropriate and reasonable to interpret section 209(e)(1)(B) as preempting states from adopting any regulation that affects how a manufacturer designs (or produces) new locomotives or new locomotive engines (including remanufactured engines). This will implement the Congressional intent that interstate operation of locomotives not be burdened by such state emissions regulations.[35] EPA is proposing a regulatory provision that codifies this approach in today's notice, and solicits comment on this issue.

EPA recognizes that certainty with respect to when state controls would be preempted would be advantageous to states and localities, as well as to industry; therefore, EPA is proposing to define the time period of preemption under section 209(e)(1)(B) more explicitly than in previous rules, for purposes of locomotives and locomotive engines. During this time, given the relationship between manufacturers and railroads, a broad range of potential in-use controls would be expected to affect how a manufacturer designs or produces new engines, and would be preempted during this time period. Those controls are discussed later in this section.

EPA believes that a period of preemption similar to but slightly longer than the useful life of the locomotive is appropriate (where useful life is approximately the average life of a locomotive between rebuilds and is also the period that locomotives would be required to remain in compliance with federal emissions standards). This approach would effectively provide the railroads with some flexibility with respect to scheduling when each locomotive is to be remanufactured, and it is consistent with the criteria for preemption, as discussed in the following paragraphs. To balance the need for such flexibility with EPA's concerns about emissions reductions the Agency is proposing that the period of preemption be 25 percent longer than the applicable useful life of a locomotive. For example, for a locomotive with a useful life of 30,000 MW-hr which reached the end of its useful life after 50 months of service, this period would be 7,500 MW-hr or about 12.5 months of additional service (assuming the same rate of use). Based on an analysis of current remanufacturing practices (see RSD), EPA believes that this approach would allow industry to largely continue its current remanufacturing practices. The Agency also requests comment on an alternative approach to the period of preemption whereby a single period of preemption (defined in years, miles, or work done) would apply to all locomotives, irrespective of their useful lives.

It is important to note that the Agency expects that emission performance will not suddenly degrade at the end of a locomotive's useful life, but rather that any deterioration which does occur would generally be gradual. In fact, given the rigorous compliance program which is being proposed, EPA expects that most locomotives will be designed and built such that those that are operated within this 25 percent window would generally remain in compliance with the applicable emissions standards. Moreover, as was discussed previously, the Agency specifications for useful life are based on average time between remanufacturing events. If a majority of locomotives were being operated significantly longer than their useful lives, the proposed regulations would require that manufacturers and remanufacturers begin to specify longer useful lives.

EPA believes that certain categories of potential state requirements would be preempted under the proposed approach, including numerical emissions standards for new locomotives, fleet average standards, certification requirements (such as testing), aftermarket (retrofit) equipment requirements, and in-use testing. Numerical emissions standards and certification testing requirements for new locomotives and new locomotive engines are clearly standards or other requirements that are explicitly preempted by section 209(e)(1). EPA believes that a state fleet average standard would also be preempted since EPA expects that requiring compliance with any such standard would in effect ban the sale or production of certain new locomotives or new locomotive engines (including remanufactured locomotives that are new) for use in a state. Given the logistical challenges of operating an interstate locomotive fleet, the only practical way in which a railroad could comply would be to remanufacture all of its locomotives to comply with the fleet standard. This would effectively establish a state emissions standard for new locomotives in violation of section 209(e)(1).

Because of the unique factual circumstances surrounding locomotives, a state retrofit requirement that applied during the time period between each remanufacture (or between an engine's original manufacture and first remanufacture) would be preempted because such a requirement would affect the design, manufacture and/or remanufacture of new locomotives. Most retrofit requirements would affect engine performance, and thus lead to design changes. For example, the installation of a catalyst-type add-on system would require the original manufacturer or remanufacturer to design the locomotive and/or engine differently to account for the resulting increase in exhaust back pressure. Moreover, aftermarket devices (such as engine heaters, selective reduction catalysts, particulate traps, and exhaust gas recirculation (EGR)) would take up a significant amount of space in a locomotive; therefore, a state aftermarket equipment requirement on locomotives would be expected to cause the original manufacturer or remanufacturer to redesign the locomotive differently at the time it is first manufactured, or during remanufacturing, to account for the later addition of the aftermarket equipment. It is important to note that space is a critical issue for locomotive manufacturers and remanufacturers because rail systems operate with very tight specifications for width, height, and length. The width and height of a locomotive must be small enough to pass through tunnels and other such restrictions, while the length must be short enough to allow the locomotive to negotiate curves in existing tracks. EPA believes that retrofit equipment that states could require on non-new locomotives would also be preempted under the criteria described above. This is especially true given the unique circumstances associated with locomotives and locomotive engines. A retrofit requirement that would have little or no effect on the original manufacture of a locomotive or locomotive engine could have a significant effect on the remanufacture of that locomotive or engine. Given that the definition of new locomotive and new locomotive engine includes remanufactured locomotives and engines, retrofit requirements on locomotives and locomotive engines are more likely to have an effect on new locomotives and locomotive engines than would similar requirements on motor vehicles and other nonroad engines.

As with retrofit requirements, EPA believes that states would be preempted from adopting or enforcing non-federal in-use emissions testing programs.

[35] The Commerce Clause of the U.S. Constitution is, of course, an additional limitation on state authority that is independent of federal preemption under the Clean Air Act. The regulations proposed today are based on section 209 of the Act.

Given the unique circumstances of this industry, especially the extent to which railroads can influence locomotive design, EPA expects that manufacturers of new locomotives would be compelled by their customers to design and produce their locomotives to comply with any state in-use emissions standards, amounting to a control on emissions from new locomotives. In making this determination, the Agency considered potential state in-use testing programs in three groups: (1) Those which would hold locomotives to standards other than the federal standards; (2) those which would hold locomotives to the same numerical standards, but used different test procedures; and (3) those which would replicate the federal in-use testing program.

Under the proposed approach, states would be preempted from adopting any emissions standards for in-use locomotives. Since there is little that a locomotive operator can do to reduce emissions from in-use locomotive engines, the action needed to comply with an in-use emission standard would in effect need to be taken by the manufacturer or remanufacturer of the engine. Any meaningful attempt by a state to achieve emission reductions through in-use emission standards would be expected to require some actions to comply. As described above, this would necessarily affect the manufacturers and/or remanufacturers. This would apply to all state test programs designed to enforce any nonfederal standards, and would also hold true for state test programs using nonfederal test procedures, since both would have the practical effect of impacting locomotive design.

However, EPA is not sure whether states are preempted from adopting an in-use test program to enforce the federal standards. A duplicative state program would increase the total number of in-use locomotive emission tests conducted each year; the greater the number of states that adopt such a program, the greater the number of in-use tests. Given the relatively small number of new engines produced each year, and the small total number of in-use locomotives, the proliferation of such duplicative programs could effectively require manufacturers to include larger compliance margins in the design of their engines to deal with this unknown risk. This is because manufacturers recognize that, given manufacturing, facility, product and test variability, measured emissions will vary from locomotive to locomotive and there will always be a nonzero probability of in-use failure. However, the more testing that is conducted, the greater likelihood that at least one failure would be identified. In response to this probability and the customers' desire that no failures occur in use, manufacturers might feel compelled to design their locomotives such that the average emissions rate is far enough below the level of the standard that the risk of their locomotives failing an in-use test program approaches zero. This could affect the original locomotive engine design because achieving lower average levels means that lower emission targets are necessary. Nevertheless, EPA is not sure that these arguments justify a categorical preemption of state testing of locomotives in-use using the federal test procedure. EPA requests comment on this position.

Based on the limited ability of operators to reduce emissions, the relationship between operators and new locomotive manufacturers or remanufacturers, the expectation that states would only adopt in-use emission standards that would require additional reductions, and the potential impact of in-use testing on interstate commerce, EPA believes that nonfederal state in-use testing programs should be preempted as they would amount to emission standards for the manufacturer or remanufacturer of new locomotive engines. This combination of factors appears unique to this industry, and EPA would not expect the same preemption result to apply under other circumstances. The Agency continues to believe that state in-use testing programs for motor vehicles and other nonroad engines, including inspection and maintenance (I/M) programs, are not preempted under the Act.

This discussion of state controls that would be preempted under the regulation proposed today is not intended to be exclusive. Any state control that would affect how a manufacturer designs or produces new (including remanufactured) locomotives or locomotive engines would be preempted. EPA believes that section 209(e)(1)(B) and the regulations proposed today should be interpreted broadly in this context, in recognition of the unique circumstances affecting this industry as described above, including the impact on interstate commerce of state emissions controls on locomotives. EPA believes this is consistent with the text of section 209(e)(1)(B), the legislative history, and the applicable case law. The Agency believes that any state control within the specific categories described above would act as an emission standard or requirement for new locomotives or engines and should be preempted. EPA invites comment on this view, including whether regulatory provisions should be included to allow states to show that a specific control does not affect how a manufacturer or remanufacturer designs a new locomotive or engine, and would therefore not be preempted.

It is important to note that certain categories of potential state requirements would also be prohibited under the proposed regulations because they would require operators to make adjustments to a locomotive that would constitute tampering under the Act and the proposed regulations. Under section 203(a)(3) of the Act, tampering includes actions that can reasonably be expected to contribute to an increase in emissions of a regulated pollutant. For example, a state requirement to alter the fuel injection system or air intake system of a locomotive to achieve NO_X reductions is likely to cause increased PM and smoke emissions. Therefore, it is highly likely that a railroad operator could not comply with the state requirement without making an adjustment to its locomotive that can reasonably be expected to result in an increase in emissions of a regulated pollutant, and would therefore be violating the federal prohibition against tampering. In such cases where it would be impossible to comply with the state requirement without violating a federal prohibition, the federal law would preempt the state law. For this reason, such state requirements would be prohibited under the proposed national rule.

VI. Emission Reduction Technology

This rulemaking will be the first time locomotives and locomotive engines have been subject to EPA regulation for the pollutants of HC, CO, NO_X, PM and smoke. Much of this discussion of the emission reduction technologies is based on EPA's experience regulating similar but smaller diesel engines used in highway trucks since the 1970's. While many of the emission control technologies for highway trucks are applicable to locomotives and locomotive engines, the design and operation of locomotives and locomotive engines may preclude the effective use of some of these technologies. The following paragraphs discuss the emission control strategies that EPA believes are likely to be available to comply with today's proposed standards. These emission control strategies are considered separately for the three levels of proposed standards (*i.e.*, Tier 0, Tier I and Tier II standards).

Technologies EPA believes could be used to comply with the proposed

emission standards are listed in Table VI–1. As is discussed below, EPA has estimated which of these technologies are most likely to be employed by manufacturers and remanufacturers to meet today's proposed standards. These estimates are for purposes of calculating cost-effectiveness and appropriate levels of control only; they are not mandated control strategies. EPA developed these estimates based on its past experience with on-highway diesel engines, as well as numerous discussions with manufacturers and railroads. An extended discussion of these technologies and their potential to reduce emissions from locomotives is included in the RSD.

TABLE VI 1.—EMISSION REDUCTION TECHNOLOGIES

NO_X Reduction Strategies	
Air Handling	Turbocharging.
	Air to liquid charge air cooling.
	Air to air charge air cooling.
	Turbo compounding.
	Exhaust Gas Recirculation (EGR).
	Compression Ratio, Closed crankcase.
Fuel Delivery Systems	Injection pressure and Nozzle Design.
	Reoptimized injection timing.
	Increased injection rate.
	Injection rate shaping.
Electronic Control Systems	Electronic controls.
Combustion chamber design	Geometry, swirl.
Aftertreatment	Reduction catalyst.
	Chemical Addition.
PM and Smoke Reduction Strategies [1]	
Combustion chamber design	Increased swirl.
	Reduced crevice volume.
	Ceramic materials.
Fuel delivery Systems	Increased injection pressure.
	Limit sac volume.
Aftertreatment	Trap or catalytic oxidizer.
Smoke Control	Limiter on rate of increase of fueling.
Lubricants	Synthetic oils.
	Reduction in engine oil consumption.

[1] Most technologies that reduce particulate emissions will also reduce HC, CO and smoke to some extent.

A. Tier 0 Standards

EPA expects that locomotives currently equipped with turbocharged engines will most likely employ improved fuel injection, enhanced charge air cooling, and to some extent retarding of injection timing to reduce NO_X emissions to below the level of the proposed standards. (Note: the proposed Tier 0 standards would not require emission reductions in HC, CO, or PM compared to current, uncontrolled levels. The Tier 0 standards for HC, CO and PM are essentially caps to prevent large increases in those emissions compared to current levels.) Where practical and cost-effective, some of the pre-2000 locomotives may be equipped with electronic controls as a means of avoiding a loss in fuel efficiency resulting from injection timing retard. Improved fuel injection is expected to include injection rate changes, modifications to the spray patterns, and a reduction in injector sac volume. There may also be some small modifications to the piston design. Additionally, some models may require enhanced smoke controls to limit smoke during increases in engine power. In the case of naturally aspirated engines, modified/improved fuel injection and some retarding of injection timing are expected to be the control strategies of choice. The addition of electronic controls may also be employed.

B. Tier I Standards

The proposed Tier I emission standards will require an approximately 48 percent reduction in NO_X emissions from current levels, and may require some small reductions in HC, CO, and PM emissions (actual reductions will depend upon the size of the compliance margins that manufacturers choose to include in their designs). These locomotives can be expected to incorporate the technologies as outlined above for the Tier 0 standards, in conjunction with or superseded by the following additional technologies. Engine combustion temperatures will need to be reduced further; additional improvements in charge air cooling can therefore be expected. This could require a charge air cooling system using a separate coolant as the cooling medium. To achieve additional reductions, engine manufacturers are expected to employ a comprehensive emission management system consisting of optimized engine fuel injection strategies through electronic controls. Changes in the configuration of the combustion chamber and piston ring location may begin to appear in engines complying with the Tier I standards.

C. Tier II Standards

The proposed Tier II emission standards will require more than a 60 percent reduction in NO_X emissions and 50 percent reduction in PM and HC emissions from current levels, with smaller, but significant, reductions in CO emissions. EPA's current estimate of the technologies that will be used to comply with these emission standards includes continued improvement in charge air cooling, fuel management (including the introduction of ''rate shaping''), and combustion chamber configuration, in conjunction with an optimized electronic control system. It is uncertain, at this time, whether some form of exhaust gas recirculation (EGR) or reduced oil consumption will also be necessary.

EPA requests comment on its viewpoints and expectations expressed in this section. Commenters are encouraged to direct their comments toward a description of the technologies they believe would be necessary to meet the standards discussed above. Commenters should address issues of feasibility, durability and costs of the technologies they believe will be required.

VII. Benefits

This section contains a brief summary of the emission benefits expected from the proposed national locomotive and locomotive engine rulemaking. The complete analysis of the expected benefits is contained in the RSD. The primary focus of this rulemaking is on reducing NO_X and PM emissions. There are also reductions in HC and CO.

The benefits analysis was performed in three steps. First, the baseline locomotive fleet composition, emissions rates and total inventory were determined. Second, future fleet composition was projected, from which percentage emissions reductions for the fleet were calculated for NO_X and PM. Finally, those percent reductions were applied to the baseline fleet emissions inventories to arrive at mass emissions reductions for the fleet. Table VII–1 contains a summary of both the fleet percentage and mass reductions for both NO_X and PM. In addition to the NO_X and PM benefits shown in Table VII–1, today's proposed regulations provide reductions in HC and CO. EPA estimated those reductions by calculating the ratios of the proposed HC and CO emissions standard percent reductions to the PM standard reductions, and applying those ratios to the PM benefits previously calculated. EPA estimated that by 2040 the proposed regulations will result in total reductions of 274924 metric tons of HC and 240075 metric tons of CO. These total HC and CO reductions amount to average annual reductions of 6705 metric tons of HC and 5855 metric tons of CO per year. EPA requests comment on all aspects of this benefits analysis.

TABLE VII–1.—NATIONWIDE EMISSION REDUCTIONS OF NO_X and PM Compared to 1990 BASELINE LEVELS

[Metric tons per year]

Year	NO_X		PM	
	Percent reduction	Mass reduction	Percent reduction	Mass reduction
2000	6.7	65,538	0.0	0
2005	35.7	348,022	1.2	291
2010	39.2	382,361	7.3	1,747
2020	46.2	451,038	19.3	4,657
2040	59.7	581,934	42.4	10,224

VIII. Costs

This section contains a summary of EPA's estimate of costs associated with the proposed national locomotive rulemaking. In general, the Agency used a conservative approach to estimating costs by using the higher end of any cost ranges that were developed for specific cost components. Costs are presented for Tier 0, Tier I and Tier II locomotives on a per locomotive basis. Cost components consist of initial equipment costs, which include the one-time hardware costs associated with meeting the standards (i.e., hardware, such as aftercoolers, which are required to meet the standards initially, but are not typically replaced during remanufacture), as well as research and development costs; remanufacturing costs; fuel economy costs; [36] and certification, production line and in-use testing costs. These per locomotive costs are presented in Tables VIII–1 through VIII–3. Overall program costs and average annual program costs calculated from the per locomotive costs and projections of future locomotive fleet composition, and based on a forty-one year time period, are presented in Table VIII–4. Where applicable, costs are presented in actual and discounted format. A complete discussion of the methodology EPA used in calculating these costs is contained in the RSD. EPA requests comment on all aspects of this costs analysis, and especially encourages information and estimates from manufacturers and remanufacturers regarding the potential costs of compliance with the proposed regulations.

TABLE VIII–1.—COST PER LOCOMOTIVE—TIER 0 STANDARDS

Cost component	Cost	Comments
Initial Equipment	$75,000	Occurs in year 1.
Remanufacture	3,000	$1000 per remanufacture (average of 3 over lifetime).
Fuel	0	Total lifetime cost.
Testing:		
Cert	125	Occurs in year 1.
Prod Line	20	Occurs in year 1.
In-use	10 FTP	Occurs in years 1–40.
	115 Short Test	(Average of 17).
Total Cost	80,270	xl

TABLE VIII–2.—COST PER LOCOMOTIVE—TIER I STANDARDS

Cost component	Cost	Comments
Initial Equipment	$100,000	Occurs in year 1.

[36] The fuel economy estimates used in this analysis are worst case. Based on EPA's experience in regulating on-highway diesel engines, compliance with emission standards often improves fuel economy, especially in cases where electronic control systems are utilized.

TABLE VIII–2.—COST PER LOCOMOTIVE—TIER I STANDARDS—Continued

Cost component	Cost	Comments
Remanufacture	12,000	$2000 in Years 6, 12, 18, 24, 36.
Fuel	0	Total lifetime cost.
Testing:		
Cert	378	Occurs in year 1.
Prod Line	238	Occurs in year 1.
In-use	10 Full FTP	Occurs in years 1–40.
	115 Short Test	
Total Cost	117,616	

TABLE VIII–3.—COST PER LOCOMOTIVE—TIER II STANDARDS

Cost component	Cost	Comments
Initial Equipment	$200,000 [1]	Occurs in year 1.
Remanufacture	18,000	$3000 in Years 6,12,18,24,30,36.
Fuel	42,500	Total lifetime cost.
Testing:		
Cert	703 [1]	Occurs in year 1.
Prod Line	281	Occurs in year 1.
In-use	10 Full FTP	Occurs in years 1–40.
	115 Short Test	
Total Cost	266,484 [1]	

[1] For first five years of production, assuming the research, development and certification costs are recovered in five years. Total costs would drop to $85,781 per locomotive after five years.

TABLE VIII–4.—SUMMARY OF 41 YEAR TOTAL LOCOMOTIVE PROGRAM COSTS

[millions]

	Actual	NPV[1]
Tier 0	$1,526	$1,193
Tier I	286	211
Tier II	1,301	428
Average Annual	76	45
Total	3,113	1,831

[1] The NPV costs are based on a seven percent discount rate. A three percent rate would yield an average annual cost of $58 million and a total cost of $2,360 million.

IX. Cost-Effectiveness

The costs for NO_X or PM reductions are difficult to assign to a single pollutant due to the relationship between NO_X and PM emission generation. EPA computed cost-effectiveness for this rulemaking using only the NO_X reductions, and using the combined NO_X and PM reductions. Costs presented below are for all reductions. It should be remembered that there would also be some emission reductions in HC and CO that would be achieved from the same technology that is used for NO_X and PM control, enhancing the benefits of the program without significantly impacting the cost.

The following table (Table IX–1) summarizes the costs and emission benefits of the national locomotive rulemaking. Costs and emission benefits were computed over a 41 year program run.[37] In computing costs, EPA has generally used conservative estimates which are fairly consistent with the manufacturers' own cost estimates. EPA therefore believes this analysis to be a worst-case scenario in terms of cost to industry.

TABLE IX–1.—COST EFFECTIVENESS

	NO_X	NO_X + PM
Total Emission Reductions (millions metric tons)	17.83	18.02
Total Costs (million $)	3,113	3,113
Annual Emission Reductions (millions metric tons)	0.43	0.44
Annual Costs (millions $)	76	76
Cost Effectiveness($/ton)	175	173

X. Public Participation

A. Comments and the Public Docket

EPA desires full public participation in arriving at final rulemaking decisions. EPA solicits comments on all aspects of today's proposal from all interested parties. Wherever applicable, full supporting data and detailed analyses should also be submitted to allow EPA to make maximum use of the comments. Commenters are especially encouraged to provide specific suggestions for changes to any aspects of the proposal that they believe need to be modified or improved. All comments should be directed to the EPA Air Docket Section, Docket No. A–94–31 (see **ADDRESSES**).

Commenters desiring to submit proprietary information for consideration should clearly distinguish such information from other comments to the greatest extent possible and label it ''Confidential Business Information.'' Submissions containing such

[37] EPA used a 41-year program run to more accurately reflect lifetime costs associated with locomotives and locomotive engines, which have long lives (40 years or more).

proprietary information should be sent directly to the contact person listed above, and not to the public docket, to insure that proprietary information is not inadvertently placed in the docket. If a commenter wants EPA to base the final rule in part on a submission labeled as confidential business information, then a nonconfidential version of the document which summarizes the key data or information should be sent to the docket.

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

B. Public Hearing

Any person desiring to present testimony regarding this proposal at the public hearing (see **DATES**) should, if possible, notify the contact person listed above of such intent at least seven days prior to the day of the hearing to allow for orderly scheduling of the testimony. The contact person should also be provided an estimate of the time required for the presentation of the testimony and notification of any need for audio/visual equipment.

It is suggested that sufficient copies of the statement or material to be presented be brought to the hearing for distribution to the audience. In addition, it will be helpful for EPA to receive an advance copy of any statement or material to be presented at the hearing prior to the scheduled hearing date, in order for EPA staff to give such material full consideration. Such advance copies should be submitted to the contact person listed above.

The official record of the hearing will be kept open for 30 days following the hearing to allow submission of rebuttal and supplementary testimony. All such submittals should be directed to the EPA Air Docket Section, Docket No. A–94–31 (see **ADDRESSES**)

XI. Administrative Designation and Regulatory Assessment Requirements

A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993) the Agency must determine whether the regulatory action is ''significant'' and therefore subject to OMB review and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may: (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal government or communities; (2) create a serious inconsistency or otherwise interfere with action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, EPA has determined that this is a ''significant regulatory action'' within the meaning of the Executive Order. EPA has submitted this action to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

B. Regulatory Flexibility

The Regulatory Flexibility Act (RFA)[38] generally requires an agency to conduct a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and small governmental jurisdictions. This proposal would not have a significant impact on a substantial number of small entities. The Agency has identified two types of small entities which could potentially be impacted by this proposal: Small businesses involved in locomotive remanufacturing and small short line railroads. EPA believes that, while today's proposal could potentially affect both of these groups, the impacts would be minimal or nonexistent for the following reasons.

In the case of small remanufacturing businesses, the proposed rules governing remanufacturing of locomotives or locomotive engines require that any remanufacture of post-1972 locomotives or engines (except those exempted from the remanufacture requirements, as discussed in the next paragraph) be done such that the resultant locomotive or locomotive engine is in a configuration certified as meeting applicable emissions standards. The certification of a remanufactured locomotive or engine configuration has two cost components associated with it. The first is the cost of developing and manufacturing the requisite emission control technology. The second is the cost of emission testing associated with compliance. Small remanufacturing businesses often do not do their own research and development for the technology they use, but instead purchase the hardware from larger firms. It is expected that today's proposed requirements will not change this practice, and that these small firms will enter into contractual agreements with larger firms. Under such an arrangement the larger firms will continue to do the development work and will be the certificate holder for a particular engine family and, as the certificate holder, would be responsible for providing an emissions warranty and conducting the PLT and in-use testing programs, as required by the proposed regulations. This type of arrangement is expected to resolve the issue of technology development and manufacturing costs for small remanufacturing businesses. The Agency requests comments regarding whether additional provisions should be established to minimize market shifts that could adversely affect small businesses that either manufacture or remanufacture parts for locomotive remanufacturing.

In the case of the small railroads, the Agency believes that the amount of leadtime provided in today's proposal should allow for sufficient advance planning to minimize the impacts. First, these small railroads do not tend to purchase freshly manufactured locomotives, but instead purchase used locomotives from the Class I railroads. For this reason the costs associated with the compliance of freshly manufactured locomotives would not be borne by the small railroads. Additionally, these small railroads will likely have several years following the effective date of today's proposed standards before any used locomotives they purchase will be remanufactured, and thus required to comply with these standards. Furthermore, the Agency proposes to allow an exemption for railroads with 500 employees or less from the Tier 0 standards, as discussed earlier in this notice. Finally, the Agency is proposing that the railroad in-use test program only apply to Class I railroads, thus exempting all small railroads from this testing requirement. In developing this proposed regulation, EPA has tailored the requirements so as to minimize or eliminate the effects on small entities. Therefore, I certify that this action will not have a significant economic impact

[38] 5 U.S.C. 605(b).

on a substantial number of small entities.

C. Paperwork Reduction Act

The information collection requirements in this proposed rule will be submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C 3501 *et seq.* An Information Collection Request has been prepared by EPA (ICR No. 1800.01) and a copy may be obtained from Sandy Farmer, OPPE Regulatory Information Division, U.S. Environmental Protection Agency (2137), 401 M St., SW., Washington, DC 20460 or by calling (202) 260–2740.

The information being collected is to be used by EPA to certify new locomotives and new locomotive engines in compliance with applicable emissions standards, and to assure that locomotives and locomotive engines comply with applicable emissions standards when produced and in-use.

The annual public reporting and recordkeeping burden for this collection of information is estimated to average 494 hours per response, with collection required quarterly or annually (depending on what portion of the program the collection is in response to). The estimated number of respondents is 20 and the estimated number of responses is 126. The total annualized capital/startup cost is $1.8 million. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjusting the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

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

Comments are requested on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques. Send comments on the ICR to the Director, OPPE Regulatory Information Division, U.S. Environmental Protection Agency (2137), 401 M St., SW, Washington, DC 20460, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., NW, Washington, DC 20503, marked ''Attention: Desk Officer for EPA.'' Include the ICR number in any correspondence. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after February 11, 1997, a comment to OMB is best assured of having its full effect if OMB receives it by March 13, 1997. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

Today's rule contains no Federal mandates (under the regulatory provisions of Title II of the UMRA) for State, local, or tribal governments because the rule imposes no enforceable duty on any State, local or tribal governments. Nothing in the proposed program would significantly or uniquely affect small governments. EPA has determined that this rule contains federal mandates that may result in expenditures of $100 millon or more in any one year for the private sector. EPA believes that the proposed program represents the least costly, most cost effective approach to achieving the air quality goals of the proposed rule. EPA has performed the required analyses under Executive Order 12866 which contains identical analytical requirements.

XII. Copies of Rulemaking Documents

The preamble, draft regulatory language and draft Regulatory Support Document (RSD) are available in the public docket as described under ''ADDRESSES'' above and are also available electronically on the Technology Transfer Network (TTN), which is an electronic bulletin board system (BBS) operated by EPA's Office of Air Quality Planning and Standards and via the internet. The service is free of charge, except for the cost of the phone call.

A. Technology Transfer Network (TTN)

Users are able to access and download TTN files on their first call using a personal computer and modem per the following information.

TTN BBS: 919–541–5742 (1200–14400 bps, no parity, 8 data bits, 1 stop bit)
Voice Helpline: 919–541–5384
Also accessible via Internet: TELNET ttnbbs.rtpnc.epa.gov Off-line: Mondays from 8:00 AM to 12:00 Noon ET

A user who has not called TTN previously will first be required to answer some basic informational questions for registration purposes. After completing the registration process, proceed through the following menu choices from the Top Menu to access information on this rulemaking.

<T> GATEWAY TO TTN TECHNICAL AREAS (Bulletin Boards)
<M> OMS—Mobile Sources Information
<K> Rulemaking & Reporting
<6> Non-Road
<3> File area #3 * * * Locomotive Emission Standards

At this point, the system will list all available files in the chosen category in

reverse chronological order with brief descriptions. To download a file, select a transfer protocol that is supported by the terminal software on your own computer, then set your own software to receive the file using that same protocol.

If unfamiliar with handling compressed (i.e. ZIP'ed) files, go to the TTN top menu, System Utilities (Command: 1) for information and the necessary program to download in order to unZIP the files of interest after downloading to your computer. After getting the files you want onto your computer, you can quit the TTN BBS with the <G>oodbye command.

Please note that due to differences between the software used to develop the document and the software into which the document may be downloaded, changes in format, page length, etc. may occur.

B. Internet

Rulemaking documents may be found on the internet as follows:

World Wide Web
http://www.epa.gov/omswww

FTP
ftp://ftp.epa.gov Then CD to the/pub/gopher/OMS/directory

Gopher
gopher://gopher.epa.gov:70/11/Offices/Air/OMS
Alternatively, go to the main EPA gopher, and follow the menus:
gopher.epa.gov
EPA Offices and Regions
Office of Air and Radiation
Office of Mobile Sources

List of Subjects

40 CFR Part 85

Environmental protection, Air pollution control, Railroads.

40 CFR Part 89

Environmental protection, Administrative practice and procedure, Air pollution control, Nonroad source pollution.

40 CFR Part 92

Environmental protection, Administrative practice and procedure, Air pollution control, Railroads, Reporting and recordkeeping requirements.

Dated: January 31, 1997.

Carol M. Browner,

Administrator.

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