ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 85, 86, and 1039

[EPA–HQ–OAR–2011–1032; FRL–9673–1]

RIN 2060–AR54

Heavy-Duty Highway Program: Revisions for Emergency Vehicles

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: EPA is taking direct final action on revisions to its heavy-duty diesel regulations that will enable emergency vehicles, such as dedicated ambulances and fire trucks, to perform mission-critical life-saving work without risking that abnormal conditions of the emission control system could lead to decreased engine power, speed or torque. The revisions will allow manufacturers to request and EPA to approve modifications to emission control systems on emergency vehicles so they do not interfere with the vehicles' missions. This action is not expected to result in any significant changes in regulatory burdens or costs.

DATES: This rule is effective on August 7, 2012 without further notice, unless EPA receives adverse comment. If we receive relevant adverse comment on distinct elements of this rule by July 27, 2012, we will publish a timely withdrawal in the **Federal Register** indicating which provisions we are withdrawing. The provisions that are not withdrawn will become effective on August 7, 2012, notwithstanding adverse comment on any other provision.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2011–1032, by one of the following methods:

- *www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *Email: a-and-r-docket@epa.gov.*
- *Fax:* (202) 566–9744
- *Mail:* Environmental Protection Agency, Air Docket, Mail-code 6102T, 1200 Pennsylvania Ave. NW., Washington, DC 20460.
- *Hand Delivery:* EPA Docket Center (EPA/DC), EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC, Attention Docket No. EPA–HQ–OAR–2010–0162. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2011–1032. For additional instructions on submitting written comments, see the **SUPPLEMENTARY INFORMATION** section on ''Public Participation'' in the parallel Notice of Proposed Rulemaking in today's **Federal Register**.

Docket: All documents in the docket are listed in the *www.regulations.gov* index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at EPA Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: Lauren Steele, Environmental Protection Agency, Office of Transportation and Air Quality, Assessment and Standards Division, 2000 Traverwood Drive, Ann Arbor, Michigan 48105; telephone number: 734–214–4788; fax number: 734–214–4816; email address: steele.lauren (@epa.gov).

SUPPLEMENTARY INFORMATION:

Why is EPA using a direct final rule?

EPA is publishing this rule without a prior proposed rule because we view this as a noncontroversial action and anticipate no adverse comment. This is also to expedite the regulatory process to allow engine and vehicle modifications to occur as soon as possible. However, in the ''Proposed Rules'' section of today's **Federal Register**, we are publishing a separate document that will serve as the proposed rule to adopt these revisions for emergency vehicles if adverse comments are received on this direct final rule. We will not institute a second comment period on this action. Any parties interested in commenting must do so at this time. For further information about commenting on this rule, see the **ADDRESSES** section of this document.

If EPA receives adverse comment on a distinct provision of this rulemaking, we will publish a timely withdrawal in the **Federal Register** indicating which provisions we are withdrawing. The provisions that are not withdrawn will become effective on the date set out above, notwithstanding adverse comment on any other provision. We would address all public comments in a subsequent final rule based on the proposed rule.

EPA is publishing this direct final rule to expedite the deployment of solutions that will best ensure the readiness of the nation's emergency vehicles. We request that commenters identify in your comments any portions of the action with which you agree and support as written, in addition to any comments regarding suggestions for improvement or provisions with which you disagree. In the case of a comment that is otherwise unclear whether it is adverse, EPA would interpret relevant comments calling for more flexibility or less restrictions for emergency vehicles as supportive of the direct final action. In this way, the EPA will be able to adopt those elements of this action that are fully supported and most needed today, while considering and addressing any adverse comments received on the proposed rule, in the course of developing the final rule.

Does this action apply to me?

This action may affect you if you produce or import new heavy-duty or nonroad diesel engines that are intended for use in vehicles that serve the emergency response industry, including all types of dedicated and purpose-built fire trucks and ambulances. The following table gives some examples of entities that may be affected by this action. Because these are only examples, you should carefully examine the existing and revised regulations in 40 CFR parts 85, 86 and 1039. If you have questions regarding how or whether these rules apply to you, you may call the person listed in the **FOR FURTHER INFORMATION CONTACT** section above.

Category	NAICS code [a]	Examples of potentially affected entities
Industry	336111 336112 333618 336120	Motor Vehicle Manufacturers, Engine and Truck Manufacturers.

Category	NAICS code [a]	Examples of potentially affected entities
Industry	541514 811112 811198	Commercial Importers of Vehicles and Vehicle Components.
Industry	811310	Engine Repair, Remanufacture, and Maintenance.

Note:
[a] North American Industry Classification System (NAICS).

Table of Contents

I. Overview

EPA is adopting amendments to its heavy-duty diesel engine programs that will specifically allow engine manufacturers to request to deploy specific emission controls or settings for new and in-use engines that are sold for use only in emergency vehicles. EPA is adopting these revisions to enable fire trucks and ambulances with heavy-duty diesel engines to perform mission-critical life- and property-saving work without risk of losing power, speed or torque due to abnormal conditions of the emission control systems.

EPA's current diesel engine requirements have spurred application of emission controls systems such as diesel particulate filters (commonly called soot filters or DPF's) and other after-treatment systems on most new diesel vehicles, including emergency vehicles. Some control system designs and implementation strategies are more effective in other segments of the fleet than in emergency vehicles, especially given some emergency vehicles' extreme duty cycles. By this action, EPA intends to help our nation's emergency vehicles perform their missions; to better ensure public safety and welfare and the protection of lives and property.

II. Statutory Authority and Regulatory Background

A. Statutory Authority

Section 202(a)(1) of the Clean Air Act (CAA or the Act) directs EPA to establish standards regulating the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines that, in the Administrator's judgment, causes or contributes to air pollution which may reasonably be anticipated to endanger public health or welfare. Such standards apply for the useful life of the vehicles or engines. Section 202(a)(3) requires that EPA set standards applicable to emissions of hydrocarbons, carbon monoxide, NO_X and particulate matter (PM) from heavy-duty trucks that reflect the greatest degree of emission reduction achievable through the application of technology which we determine will be available for the model year to which the standards apply. We are to give appropriate consideration to cost, energy, and safety factors associated with the application of such technology. We may revise such technology-based standards, taking costs into account, on the basis of information concerning the effects of air pollution from heavy-duty vehicles or engines and other sources of mobile source related pollutants on the public health and welfare.

Section 202(a)(4)(A) of the Act requires the Administrator to consider risks to public health, welfare or safety in determining whether an emission control device, system or element of design shall be used in a new motor vehicle or new motor vehicle engine. Under section 202(a)(4)(B), the Administrator shall consider available methods for reducing risk to public health, welfare or safety associated with use of such device, system or element of design, as well as the availability of other devices, systems or elements of design which may be used to conform to requirements prescribed by (this subchapter) without causing or contributing to such unreasonable risk.

Section 206(a) of the Act requires EPA to test, or require to be tested in such manner as it deems appropriate, motor vehicles or motor vehicle engines submitted by a manufacturer to determine whether such vehicle or engine conforms to the regulations promulgated under section 202. Section 206(d) provides that EPA shall by regulation establish methods and procedures for making tests under section 206.

Section 213 of the Act gives EPA the authority to establish emissions standards for nonroad engines and vehicles (42 U.S.C. 7547). Sections 213(a)(3) and (a)(4) authorize the Administrator to set standards and require EPA to give appropriate consideration to cost, lead time, noise, energy, and safety factors associated with the application of technology. Section 213(a)(4) authorizes the Administrator to establish standards to control emissions of pollutants (other than those covered by section 213(a)(3)) which ''may reasonably be anticipated to endanger public health and welfare.'' Section 213(d) requires the standards under section 213 to be subject to sections 206–209 of the Act and to be enforced in the same manner as standards prescribed under section 202 of the Act.

B. Background: 2007 and 2010 NO_X and PM Standards

(1) On-Highway Standards

On January 18, 2001, EPA published a rule promulgating more stringent standards for NO_X and PM for heavy-duty highway engines (''the heavy-duty highway rule'').[1] The 0.20 gram per brake-horsepower-hour (g/bhp-hr) NO_X standard in the heavy-duty highway rule first applied in MY 2007. However, because of phase-in flexibility provisions adopted in that rule and use of emission credits generated by manufacturers for early compliance, manufacturers were able to continue to produce engines with NO_X emissions greater than 0.20 g/bhp-hr. The phase-in provisions ended after MY 2009 so that the 0.20 g/bhp-hr NO_X standard was fully phased-in for model year 2010. Because of these changes that occurred in MY 2010, the 0.20 g/bhp-hr NO_X emission standard is often referred to as the 2010 NO_X emission standard, even though it applied to engines as early as MY 2007.

The heavy-duty highway rule adopted in 2001 also included a PM emissions standard for new heavy-duty diesel engines of 0.01 g/bhp-hr, effective for engines beginning with MY 2007. Due to the flexible nature of the phase-in schedule described above, manufacturers have had the opportunity to produce engines that met the PM standard while emitting higher levels of NO_X. During the phase-in years, manufacturers of diesel engines generally produced engines that were tuned so the combustion process inherently emitted lower engine-out NO_X while relying on PM after-treatment to meet the PM standard. The principles of combustion chemistry dictate that conditions yielding lower engine-out NO_X emissions generally result in higher engine-out PM emissions. This is what we call the NO_X-PM trade-off. For many new low-NO_X diesel engines today, engine-out PM emissions could be at or above the levels seen with the MY 2004 standards (0.1 g/bhp-hr). To meet today's stringent PM standards, manufacturers rely on diesel particulate filter after-treatment to clean the exhaust.

(2) Nonroad Standards

EPA adopted similar technology-forcing standards for nonroad diesel engines on June 29, 2004.[2] These are known as the Tier 4 standards. This program includes requirements that will generally involve the use of NO_X after-treatment for engines above 75 hp and PM after-treatment (likely soot filters) for engines above 25 hp. These standards phase in during the 2011 to 2015 time frame.

III. Emergency Vehicle Provisions

A. Background on Regulation of Emergency Vehicles

Typically, the engines powering our nation's emergency vehicles belong to the same certified engine families as engines that are installed in similarly sized vehicles sold for other public and private uses.[3] Historically, engine and vehicle manufacturers have sought EPA certification for broad engine families and vehicle test groups that are defined by similar emissions and performance characteristics. Engine families typically only consider the type of vehicle in which the engine is intended to be installed to the extent that it fits into a broad vehicle weight class and, to a lesser extent, the vehicle's intended duty cycle (i.e. urban or highway).

Because of the above-described manufacturing practices and the narrow CAA authority for any exemptions, EPA has historically regulated engines for emergency vehicles, including ambulances as well as police vehicles and fire-fighting apparatus, in the same manner as other engines.

In the public comments received on the proposed heavy-duty highway rule, EPA received some comments about DPF technologies and regeneration cycles on heavy-duty trucks, including one comment that expressed concerns that the systems may not be failsafe.[4] However, none of the comments specifically raised technical feasibility with respect to emergency vehicles, and EPA's response was based on the best information available at the time. After publishing the final rule requiring heavy-duty highway engines to meet performance standards that compelled technologies such as DPF's, EPA received a letter from the National Association of State Fire Marshals, requesting some provision for public safety in implementing this new rule, considering that fire departments across the nation have trouble covering basic costs and may not have funds for more expensive trucks.[5] This letter did not raise any technical feasibility issues, and EPA did not see a need to take action.

More recently EPA has received letters from fire apparatus manufacturers and ambulance companies requesting relief from power or speed inducements related to low levels of DEF for SCR systems on emergency vehicles.[6] Power and speed reduction inducements were new on vehicles equipped with SCR. These were not specifically mandated by EPA but designed by manufacturers to occur if DEF levels became low, to induce operators of the vehicles to perform the required emission-related maintenance in use. More discussion on this, including why the emergency response community requested relief and what action EPA took, is found below in Section III.B(3).

Recently, beginning in October 2011, EPA received a series of comment letters from fire chiefs and other interested stakeholders, requesting regulatory action to relieve emergency vehicles from the burden of complying with the 2007 PM standards.[7] EPA promptly opened a dialogue with the fire chiefs and engine manufacturers to understand the issues. Power and speed reductions were occurring on some vehicles with soot filters but without SCR systems, in part related to engine protection measures designed by manufacturers. Essentially, these soot filters are supposed to be self-cleaning by periodically burning off accumulated soot during normal vehicle use. The cleaning process is called regeneration, and when this doesn't work as designed, the filter gradually gets more clogged, which can lead to engine problems. EPA has determined that while other

[1] Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (66 FR 5001).

[2] Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel (69 FR 38958).

[3] In this rule, emergency vehicle is defined as a fire truck or an ambulance for on-highway applications, and for nonroad applications, we are defining emergency equipment as specialized vehicles to perform aircraft rescue and firefighting functions at airports, or wildland fire apparatus. See Section III.C and revisions at 40 CFR 86.1803–01 and 40 CFR 1039.801.

[4] Heavy-Duty Highway Final Rule, December 21, 2000, Response to Comments, Section 3.2.1, ''Technical Feasibility of Engine/Vehicle Standards//Diesel Engine Exhaust Standards,'' page 3–58 to 3–60, available at *http://www.epa.gov/otaq/highway-diesel/regs/2007-heavy-duty-highway.htm.*

[5] Letter dated February 1, 2001 to C. Whitman, EPA Administrator from G. Miller, President, National Association of State Fire Marshalls.

[6] *See,* for example, letter dated October 22, 2009, from Roger Lackore of the Fire Apparatus Manufacturers' Association and Randy Hanson of the Ambulance Manufacturers Division, to Keisha Jennings of EPA.

[7] See, for example, letter dated October 4, 2011 from Congressman Filner to EPA Administrator Jackson, and letter dated October 14, 2011, from Director Cimini of the Southeast Association of Fire Chiefs to EPA Administrator Jackson.

pathways are available for resolving some issues related to soot filters on emergency vehicles, there remains a public safety issue related to design of engines and emission control systems on emergency vehicles that should be addressed through this rulemaking. More discussion of this, including why relief was requested and what other actions can be taken in addition to EPA regulation, is found below in Sections III.B and III.C.

There have been some examples of EPA providing limited exemptions for other types of emergency-use engines and vessels. Further descriptions of current and proposed limited exemptions are provided in the Notice of Proposed Rulemaking published elsewhere in today's **Federal Register.** These limited exemption provisions are only applicable to newly certified engines. They are not applicable to any existing in-use engines that are already deployed in emergency equipment.

B. Why is EPA taking this action?

EPA is amending its regulations to facilitate engine manufacturers' design and implementation of reliable and robust emission control systems with regeneration strategies and other features that do not interfere with the mission of emergency vehicles. Through the comments and letters we have received, as well as our own outreach and data-gathering efforts, we have learned that some emission control systems on fire trucks and ambulances today, in particular, certain applications using diesel particulate filters, are requiring an unexpected amount of operator interventions, and there are currently a nontrivial number of emergency vehicles that are electronically programmed to cut power or speed—even while responding to an emergency—when certain operational parameters are exceeded in relation to the emission control system. As we understand it, the experiences of operators are mixed, with some not reporting any problems and some reporting problems that raise public safety and welfare concerns.

EPA's standards are performance-based, and reflect the greatest degree of emission reduction achievable, according to CAA sections 202(a)(3) and 213(a)(3). Our on-highway and nonroad PM standards do not specify the type of diesel particulate filter for manufacturers to use, nor do they even mandate the use of such a filter. Our analysis of the feasibility of the 2007 on-highway PM standard is presented in Chapter III of the final Regulatory Impact Analysis (RIA) for that rule.[8] Our analysis of the feasibility of the Tier 4 nonroad compression ignition engine standards that will be phasing in through 2015 is presented in Chapter 4 of that rule's final RIA.[9] For most nonroad engines, these standards are similar in stringency to the 2007 on-highway heavy-duty engine and vehicle standards. As described below in Section III.H, these two rules are providing billions of dollars of annual health benefits by virtually eliminating harmful PM emissions from the regulated engines. Even so, EPA is required by sections 202(a)(4)(B) and 213(c) of the Act to, among other things, consider methods for reducing risk to public safety and welfare associated with the use of emission control devices or systems.

Based on the information available to us, we have concluded that there is an indirect risk to public safety and welfare associated with some examples of emission control systems when they are deployed on emergency vehicles that experience extreme duty cycles. This indirect risk is related to the readiness of emergency vehicles and the risk that they may not be able to respond during emergencies with the full power, torque, or speed that the engine is designed to provide. While this risk is not inherent to the requirement to reduce emissions or to the use of diesel particulate filters on emergency vehicles, EPA believes it is appropriate to ensure that emergency vehicles can perform their emergency missions without the chance of such consequences.

EPA's current rules already provide the opportunity for manufacturers to address many issues through applications for certification of new engines and new vehicles. There is also currently a mechanism for manufacturers to deploy field modifications to the in-use fleet, including those that are substantially similar to approved upgrades for new vehicles, as well as those that apply only to vehicles that are no longer in production. As manufacturers become aware of the need for upgrades or enhancements, this process occurs within the new and in-use fleet with various degrees of application. While that process is occurring today, EPA views this issue as serious enough that we would be remiss if we did not act to ensure that our regulations clearly offer the needed flexibilities for emergency vehicles.

(1) How does a DPF work?

To explain more fully the issues that we are addressing with this action, and hence why we are taking this action, we are providing here some background information on diesel particulate filters and the process of DPF regeneration. DPF's are exhaust after-treatment devices that significantly reduce emissions from diesel-fueled vehicles and equipment. DPF's physically trap PM and remove it from the exhaust stream. Figure III–1 depicts a schematic of a wall-flow monolith style filter, with the black arrows indicating exhaust gas laden with particles, and the gray arrows indicating filtered exhaust gas. This style of filter is the most common in today's heavy-duty diesel engines, and has very high rates of filtration, in excess of 95 percent.[10]

[8] Final Regulatory Impact Analysis for the ''2007 Heavy-Duty Highway Rule,'' EPA420–R–00–026, December 2000. Chapter III, Emissions Standards Feasibility, is available at *http://www.epa.gov/otaq/highway-diesel/regs/ria-iii.pdf.*

[9] Final Regulatory Impact Analysis for ''Control of Emissions from Nonroad Diesel Engines,'' EPA420–R–04–007, May 2004. Chapter 4, Technologies and Test Procedures for Low-Emission Engines, is available *http://www.epa.gov/nonroad-diesel/2004fr/420r04007e.pdf.*

[10] *See* Final RIA Chapter III, Note 8, above.

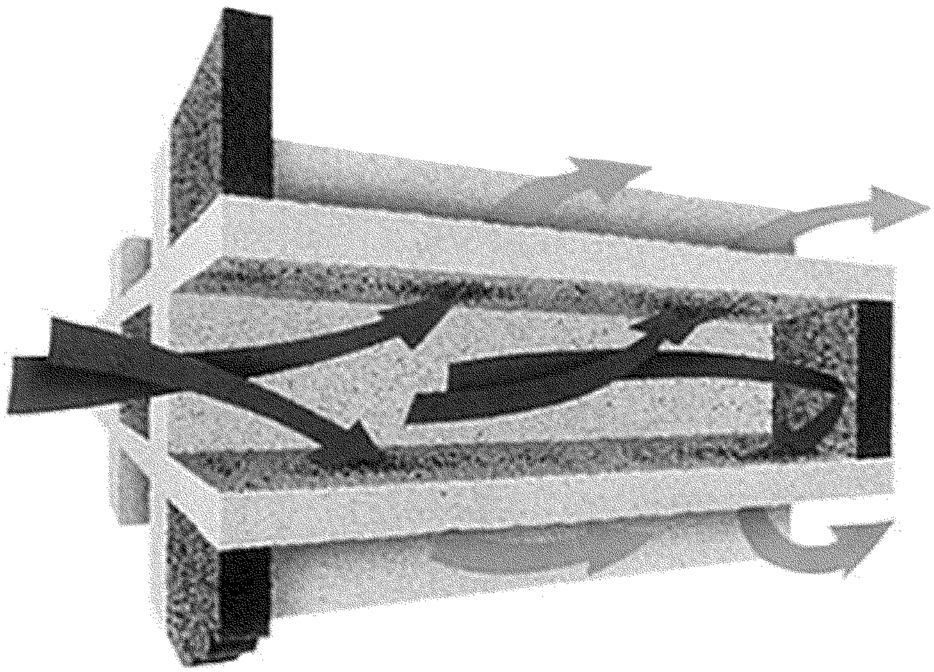

Figure III-1 Illustration of air flow pattern in a wall-flow monolith style PM filter

(Source: Corning)

To be successful, these devices generally must be able to accomplish two things: Collect PM and clean away accumulated PM. There are two main types of PM that can accumulate: combustible and non-combustible, and two very different types of cleaning methods: regeneration and ash cleaning. Regeneration occurs relatively frequently, and is designed to complete the combustion (oxidation) of the trapped combustible PM components, releasing them to the exhaust as gas-phase compounds (mostly H_2O and CO_2). In contrast to the PM that can be oxidized and carried out the tailpipe as gases, the non-combustible PM such as metallic ash cannot be destroyed through regeneration and will always remain inside a DPF. To clean ash from a DPF, the filter unit is removed from the vehicle and professionally cleaned with a special machine. Fortunately, there is very little ash formation from modern diesels so ash cleaning and ash disposal occurs very infrequently, generally with at least 150,000 mile service intervals, and the mass of accumulated ash is generally small (a few teaspoons).[11] [12] This distinction is made here because the ash cleaning process is not a source of concern that has given rise to this EPA action. The infrequent cleaning of noncombustible materials from DPF's is not part of the scope of this action.

Regeneration, however, is a type of routine DPF cleaning that must occur regularly, and for which EPA does not specify a minimum interval in its regulations, in contrast to the ash cleaning process. At its very essence, regeneration involves burning off the accumulated soot. Since this burning can involve extra heat and/or oxygen or oxygen-containing compounds, this must be done carefully and safely to avoid uncontrolled burns. The discussion below in Section III.B.(1)(b) describes the three types of routine DPF regeneration: Passive regeneration, automatic active regeneration, and manual (parked) active regeneration. Additional discussion is provided in the accompanying Notice of Proposed Rulemaking published elsewhere in today's **Federal Register** and in a memorandum to the docket.[13] Below, we discuss the reason why regeneration is needed at all.

(a) Failure of a DPF

When the style of filter installed on a diesel vehicle is the wall-flow type that is predominant in the market today, it physically traps so much of the PM that the particles accumulate on the inside of the filter and if not burned off, this PM can over time block the passages through the filtering media, making it more restrictive to exhaust flow. This is commonly referred to as ''trap plugging.'' Some other styles of filter, such as flow-through DPF's, are less prone to plugging, but do not generally reduce the PM emission rate sufficiently to meet today's stringent PM standard. Any time something gets in the way of free flowing air through an engine, it creates what we call ''exhaust backpressure.'' Even a clean, new DPF generates a small amount of exhaust backpressure due to the porous walls through which all of the exhaust flows.

Engines can tolerate a certain range of exhaust backpressure. When an increase in this backpressure, or resistance, is detected, engines can compensate to a point. An increase in exhaust backpressure from a DPF trapping more and more PM represents increased work demanded from the engine to force the exhaust gas through the increasingly

[11] EPA's regulations at 40 CFR 86.004–25(b)(4) for heavy-duty diesel engine maintenance specify a minimum interval for DPF ash cleanout from 100,000 to 150,000 mi. Many manufacturers design DPF systems with longer maintenance intervals.

[12] *See http://www.arb.ca.gov/diesel/tru/documents/ashguide.pdf.*

[13] *See* memo dated May 4, 2012, ''Diesel Particulate Filter Regeneration,'' Docket ID EPA–HQ–OAR–2011–1032.

restrictive DPF. However, unless the DPF is frequently cleansed of the trapped PM, this increased work demand can lead to reductions in engine performance and increases in fuel consumption. This loss in performance may be noticed by the vehicle operator in terms of poor acceleration and generally poor drivability of the vehicle.

If a DPF is not regenerated and it becomes plugged, there is a risk of two types of failure. The degree of this risk and which consequence may be experienced will depend on the engine and emission control system design. One consequence is that the lack of air flowing through an engine will cause an engine to shut down because it can no longer compensate for the extra work being demanded of it. The other is a risk of catastrophic DPF failure when excessive amounts of trapped PM begin to oxidize at high temperatures (i.e., DPF regeneration temperatures above 1,000 °C) leading to a ''runaway'' combustion of the PM within the DPF. This can cause temperatures in the filter media to increase beyond its physical tolerance, possibly creating high thermal stresses where the DPF materials could crack or melt. This is an unsafe condition, presenting physical danger to occupants as well as to objects and persons near the vehicle. Further, catastrophic failure can allow significant amounts of the diesel PM to pass through the DPF without being captured. That is, the DPF is destroyed and PM emission control is lost. For all these reasons, most manufacturers generally design their emission control systems to prevent uncontrolled shutdown or runaway DPF regeneration by programming the engine's electronic control module (ECM) to limit maximum engine speed, torque and/or power when excessive backpressures are detected. This mode of engine operation at reduced performance may allow a vehicle to ''limp home'' to receive service. In extreme cases the ECM may command the engine to shut down to prevent a catastrophic failure.

(b) Types of Regeneration

There are three types of routine DPF regeneration. Passive regeneration refers to methods that rely strictly on the temperatures and constituents normally available in the vehicle's exhaust to oxidize PM from a DPF in a given vehicle application. Passive regeneration is an automatic process that occurs without the intervention of an engine's on-board diagnostic and control systems, and often without any operator notice or knowledge. Passive regeneration is often a continuous process, because of which, it is sometimes referred to as continuous regeneration. In a vehicle whose normal operation does not generate temperatures needed for passive DPF regeneration, the system needs a little help to clean itself. This process is called active regeneration, and supplemental heat inputs to the exhaust are provided to initiate soot oxidation. There are two types of active regeneration: Those that may occur automatically either while the vehicle is in motion, while idling, or while powering an auxiliary device such as a pump or ladder (power take-off (PTO) mode)), and those that must be driver-initiated and occur only while the vehicle is stationary and out-of-service.

Vehicles with automatic active regeneration systems require operators to be alert to dashboard lamps and indicators. Written instructions are provided to operators to explain what each lamp means (such as high temperatures or need for regeneration) and what action is called for (such as driving at highway speeds or initiating a manual active regeneration). Because EPA emissions standards are performance based; and therefore, do not dictate any required emission control system technologies or configurations, each manufacturer has the discretion to program the timing and sequence of lamps as needed to inform drivers of the condition of the emission control system. As noted above, it is not uncommon in today's heavy-duty fleet for an engine's ECM to limit its maximum speed, torque or power when a plugging DPF is detected. These engine and emission control system protection measures can alert drivers to the need to change driving conditions to facilitate automatic active regeneration or to make plans to allow for a manual active regeneration.

A manual active regeneration allows the engine's ECM to increase engine speed and exhaust temperature to a greater extent than what is typically allowed during an automatic active regeneration. Because the ECM takes full control of an engine during a manual active regeneration, the vehicle must remain parked and not used for other purposes, such as pumping water in PTO mode. Some manual active regenerations may require towing the vehicle to a special service center, and may occur while the DPF is on the vehicle, or offline with the DPF removed from the vehicle. In such cases, if a spare DPF is not available, the vehicle could be out of service overnight. If a driver disregards such warnings, the risk of uncontrolled engine shutdown or a catastrophic DPF failure may increase. EPA encourages the design of robust systems calling for minimal driver interventions, while providing drivers with clear and early indicators before any interventions are needed. EPA also encourages accurate and thorough operator training to ensure that the correct remedial action is taken at the earliest available time.

Actively regenerating DPF systems typically require sufficient air flow, temperature and soot accumulation before an automatic active regeneration will be requested by the engine's ECM. As mentioned above, this may occur either while the vehicle is in motion or parked, if pre-set engine operating conditions are met (such as speed and temperature). When the engine's ECM signals the initiation of an automatic active regeneration and the extra heat is generated, an ideal DPF system accomplishes this as a transparent process, with no effects perceivable by the driver.

A variety of manufacturer approaches can be taken to produce the supplemental heat needed for active regeneration. Diesel engines of MY 2007 or newer often incorporate one or more of the following approaches:

- On-board electrical heaters upstream of the filter.
- Air-intake throttling in one or more of the engine cylinders. When necessary, this device would limit the amount of air entering the engine, raising the exhaust temperature and facilitating regeneration.
- Exhaust brake activation. When necessary, this device would limit the amount of exhaust exiting the engine, raising the exhaust temperature and facilitating regeneration.
- Engine speed increases. This approach is sometimes used in combination with the other approaches to deliver more heat to the filter to facilitate regeneration.
- Post top-dead-center (TDC) fuel injection. Injecting small amounts of fuel in the cylinders of a diesel engine after pistons have reached TDC introduces a small amount of unburned fuel in the engine's exhaust gases. This unburned fuel can then be oxidized over an oxidation catalyst upstream of the filter or oxidized over a catalyzed particulate filter to combust accumulated particulate matter.
- Post injection of diesel fuel in the exhaust upstream of an oxidation catalyst and/or catalyzed particulate filter. This method serves to generate heat used to combust accumulated particulates by oxidizing fuel across a catalyst present on the filter or on an oxidation catalyst upstream of the filter.

• On-board fuel burners upstream of the filter.[14]

These are presented here merely as examples, and are by no means a complete list of the strategies available to manufacturers when designing engines that use automatic active DPF regeneration, though not all may be applicable to all engines. A common approach that gets a lot of consumer attention is the use of fuel burners or fuel injection strategies. This approach is often called ''dosing.'' Vehicle owners may notice an increase in fuel consumption when driving a vehicle that relies heavily on fuel dosing for its automatic active regenerations. In this case, when an engine's ECM gives the signal, the doser injects a metered amount of diesel fuel into the exhaust flow (or cylinders), which reacts with the DPF catalyst to raise the temperature to a point that enables regeneration. EPA does not have information about which manufacturers employ this technique or the number or types of vehicles with engines that use fuel dosing as part of the active regeneration strategy. Estimates of the additional fuel use by a vehicle whose DPF regeneration system employs fuel dosing are described in the Notice of Proposed Rulemaking published elsewhere in today's **Federal Register**. This is also mentioned here because one of the possible outcomes of this EPA action is that some manufacturers may alter their strategies for automatic active regenerations on emergency vehicles, which may have a modest effect on supplemental fuel use due to dosing.

(2) Why are emergency vehicles having problems with DPF regeneration?

At the time of promulgation of the heavy-duty highway rule, EPA and the engine manufacturers expected the 2007-compliant engine emission control systems would be integrated with advanced engine controls to ensure DPF regeneration under all vehicle operating conditions and environments. While this is widely true today, the experience of the rule implementation thus far indicates there are still some exceptions.

Although EPA is aware of a relatively small number of emergency vehicles that are experiencing problems with DPF regeneration, of those that are having problems, most of the problems can be related to the vehicle's duty cycle, the ambient conditions, and/or the engine's combustion characteristics. A vehicle's duty cycle means how it is driven, including its speeds, loads, and distances, as well as time out of service and time spent idling. A vehicle's duty cycle can vary by the demographic of the service area, including whether the vehicle responds to emergencies in a rural or urban community, and whether it drives over flat or hilly terrain. Because DPF regeneration requires heat and oxygen (basic ingredients for combustion), the success of DPF regeneration strategies can also be influenced by ambient conditions such as extreme cold winter temperatures and whether the vehicle operates near sea level or at a high elevation. The engine combustion and exhaust characteristics can influence the success of a DPF regeneration strategy since parameters such as engine-out NO_X and PM emission levels can influence how easily the soot can be oxidized, and how much soot needs to be oxidized and how often.

Both the engine's duty cycle and the overall control strategy of the engine's emission control system play a large role in the success of integrating a DPF with an engine to control PM emissions. In this section we provide additional discussion of how engine combustion characteristics and vehicle duty cycle can lead to DPF regeneration problems on emergency vehicles. In Section III.D, below, we discuss our regulatory action to address these issues. While our approach specifically targets engine combustion characteristics and emission control system design, we encourage emergency vehicle owners to inquire with their dealers and manufacturers regarding suitable vehicle and engine options that are appropriate for their duty cycle as well as their demographic and geographic location.

(a) Engine Combustion Characteristics

Engine combustion characteristics can be designed to enable continuous passive regeneration or to rely heavily on automatic active regeneration. As mentioned above, regeneration is a combustion process, burning off the accumulated PM or soot. The PM is created because the initial combustion process in the engine was imperfect. To completely convert all fuel to CO_2 and water, the combustion process needs more heat and oxygen. Both of these things create NO_X because nitrogen (N_2) is naturally present in the air and readily oxidizes at high temperatures. Thus there is a NO_X-PM trade-off of most diesel combustion processes (homogeneous charge compression ignition being an exception) where lower combustion temperatures help control NO_X but create more PM, and higher temperatures that destroy PM (or prevent it from being created) can generate more NO_X.

In an engine with a DPF system, combustion settings, or calibrations that enable continuous passive regeneration, tend to be those with higher engine-out NO_X and lower engine-out PM, partly because of the higher temperatures that create the NO_X, partly because of the NO_X itself that can act as an oxidizer (to burn off soot), and partly because of the lighter soot loading rate. In contrast, engine calibrations that may lead to a heavy reliance on automatic active regeneration tend to be those with lower engine-out NO_X and higher engine-out PM, partly because of the lower temperatures, partly because of a lack of helpful NO_X, and partly because of a heavier soot loading rate. Note that ''engine-out'' means emissions upstream of any after-treatment cleaning devices such as DPF or SCR. An example of a DPF system that may rely almost exclusively on active regeneration to maintain a clean PM filter, from an engine calibration perspective, would be an engine using advanced exhaust gas recirculation, because it would have very low engine-out NO_X and relatively high engine-out PM. An example of a DPF system that may rarely experience automatic active regeneration (and frequently passively regenerate), from an engine calibration perspective, would be an engine using SCR to control NO_X, because it could have comparatively high engine-out NO_X and relatively low engine-out PM. The SCR after-treatment would then reduce the high engine-out NO_X to provide very low tailpipe NO_X.

Thus it is important to note that this NO_X-PM trade-off is a critical design parameter when developing an engine that will be successfully integrated with a DPF-equipped emission control system. To date, all of the concerns expressed to EPA regarding emergency vehicles with DPF regeneration issues have been for vehicles that do not employ SCR technology, and thus may have higher engine-out PM. The differences in engine combustion characteristics of the MY 2007 vehicles compared to those of the majority of MY 2010+ vehicles support the concept that the emergency vehicle fleet may experience fewer DPF regeneration troubles as it migrates to engines that use after-treatment to meet EPA's 2010 NO_X standards. Such a trend may indicate that some engine manufacturers may see a greater need to address in-use emergency vehicles than new vehicles.

(b) Duty Cycles

As noted above, the duty cycle of a vehicle is one of the factors that

[14] MECA Diesel Particulate Filter Maintenance: Current Practices and Experience (June 2005) *http://www.meca.org/galleries/default-file/Filter_Maintenance_White_Paper_605_final.pdf.*

influences how often the DPF regenerates passively or actively. It is important to note that all DPF systems with active regeneration components also have the capability to passively oxidize soot accumulated on the filter, though some of the above-described factors may inhibit successful passive regeneration. Operation at highway speeds and high engine loads (high load means demanding more work from the engine, such as accelerating, driving uphill or carrying heavy cargo) typically leads to successful passive regeneration of a DPF. An example from a duty-cycle perspective of a vehicle that frequently experiences automatic passive regeneration would be a long-haul tractor-trailer. There is also often a threshold of speed or load that is required for automatic active regeneration strategies as well, though not as great as for passive regeneration—often at least 5 miles/hour or parked with a PTO engaged. In some vehicles, passive regeneration occurs so rarely that a DPF system relies almost exclusively on active regenerations to maintain a clean PM filter. An example of this from a duty-cycle perspective would be a vehicle that operates at idle, low speed and low load over most of its duty cycle. Many emergency vehicles fall into this category.

A detailed discussion of the duty cycles of emergency vehicles is provided in the Notice of Proposed Rulemaking published elsewhere in Today's **Federal Register**. The data provided in that discussion indicate that engines on emergency vehicles across the country are commonly operated over duty cycles that offer very limited opportunities to regenerate DPF's. It is also important to note that emergency vehicles do not typically get deployed on planned duty schedules with predictable blocks of garage time for servicing or maintenance. While some other types of vocational vehicles may have duty cycles with many characteristics similar to those shown above, emergency vehicles are unique in their need to be ready to deploy at any moment for the purpose of protecting public safety and welfare by saving human lives that may be in immediate danger.

When trucks with an engine-driven PTO are working in a stationary PTO mode, some engines achieve the conditions to enable an automatic active regeneration during this time. While this is normally designed to be a transparent process, in practice some effects of this type of regeneration have been noticed by operators. EPA has received information from fire chiefs indicating that there have been instances where engine ECM's took control from the operator during water pumping operations. When an automatic active regeneration is initiated during a water pumping operation, for example, an ECM may be programmed to alter throttle position or engine speed to achieve the conditions needed to complete an automatic active regeneration. Depending on the design of the water pumping system's pressure regulation, this may in turn affect the water pressure in the fire hoses. EPA has not heard of this occurring on a widespread basis, and has reason to believe that affected engine and truck manufacturers have identified and corrected this issue on some vehicles. EPA's current regulations already allow manufacturers to develop and request EPA approval for certification of engines with emission control strategies where the process of undergoing automatic active regeneration would not interfere with safely pumping fire suppressant.

While not addressed directly in this action, there are technologies that could be implemented to decrease the amount of time emergency vehicles spend with their main engines operating at light loads and at idle. These technologies include electronically programmed automatic engine start/stop systems and hybrids. Automatic start/stop systems automatically stop and start an engine depending upon whether or not it is needed to supply power to the vehicle. This technology is already being implemented on other heavy-duty vehicles to decrease unnecessary engine idling. Hybrid drivetrains also decrease engine idling with an integrated alternate power source such as a battery. We are currently seeing an increase in the use of hybrid technologies in heavy-duty diesel vocational vehicles. Garbage trucks, utility company trucks, and other work trucks are using hybrid technology to power on-board hydraulic systems and cab heating and cooling systems. In conventional vehicles these systems are powered by a main engine typically operating at light load or at idle. Because automatic start/stop and hybrid technologies improve fuel economy and decrease greenhouse gas emissions, we believe that they will be used in more and more vehicles in the future. We believe there is potential for these technologies to be integrated into future designs of emergency vehicles to decrease their operation at light loads and at idle. Such technologies would not only improve fuel economy and decrease greenhouse gas emissions from emergency vehicles, they would also help to prevent their diesel particulate filters from becoming plugged due to excessive operation at light loads and at idle. While we are not taking any specific action at this time related to decreasing the amount of time emergency vehicles operate at light load or at idle, in the accompanying NPRM, we request comment on the potential for application of alternate power sources and idle reduction technologies on emergency vehicles.

(3) What are the concerns for emergency vehicles using SCR?

Selective Catalytic Reduction (SCR) is an exhaust after-treatment system used to control NO_X emissions from heavy-duty engines by converting NO_X into nitrogen (N_2) and water (H_2O). The technology depends on the use of a catalytic converter and a chemical reducing agent, which generally is in an aqueous urea solution, and is often referred to as diesel exhaust fluid (DEF). Some trade names for this chemical reductant include AdBlue, BlueDef, NO_XBlue, and TerraCair.

Most engine manufacturers chose to comply with the 2010 NO_X emission standard by adding SCR to their engine models. In general, the approach with an SCR system has been a sound and cost effective pathway to comply with EPA's 2010 emissions standards, and it is the primary path being used today.

DEF is injected into the exhaust upstream of the SCR catalyst where it forms ammonia and carbon dioxide. The ammonia then reacts with NO and NO_2, so that one molecule of urea can reduce two molecules of NO or one molecule of NO_2. A robust SCR system can achieve about 90 percent reduction in cycle-weighted NO_X emissions. Improvements have been made over the last several years to improve the NO_X conversion rate and reduce the impact of lower exhaust temperatures on the conversion efficiency.

Because an SCR system is only effective when DEF is injected into the exhaust, we consider refilling a vehicle's DEF tank to be a critical emission-related engine maintenance requirement. We are proposing to take action to establish this in our regulations, as described in Section V of the Notice of Proposed Rulemaking published elsewhere in today's **Federal Register**. Therefore, manufacturers have implemented a number of strategies to induce a vehicle operator to refill a vehicle's DEF tank when needed. These operator inducements generally include first illuminating one or more dashboard lights to warn the operator that the DEF tank needs to be refilled soon. However, if such initial inducements are persistently ignored by the vehicle operator, eventually additional inducements are typically activated that decrease the maximum speed or power of the vehicle. These additional inducements are intended to create conditions making operational conditions of the vehicle increasingly unacceptable if the initial dashboard lamp illumination inducements are persistently ignored. Similar inducements may occur in cases where DEF quality does not meet system specifications, or if the SCR system is not functioning correctly for another reason.

While decreasing vehicle performance can be an effective inducement strategy, we believe it may not be appropriate in all situations for emergency vehicles because of their special need to be ready at any moment for the purpose of protecting public safety and welfare by saving human lives that may be in immediate danger. We recognized this during the initial implementation of our 2010 NO_X standards, and we worked with the Fire Apparatus Manufacturers' Association (FAMA), the Ambulance Manufacturers Division of the National Truck Equipment Manufacturers Association, and the International Association of Fire Chiefs to support the publication of a May 18, 2010 memo that instructed emergency vehicle manufacturers and engine manufacturers to implement less severe inducement strategies for emergency vehicles.[15] In this rule we are taking additional steps so that emergency vehicle manufacturers and engine manufacturers have the option to further reduce the severity or eliminate altogether any performance related inducements that are or could be implemented on emergency vehicles and their engines during emergency situations. We believe that this additional flexibility will help to prevent any abnormal condition of a vehicle's emission control system from adversely affecting the speed, torque, or power of an emergency vehicle during emergency situations.

C. What would occur if EPA took no action?

(1) The Industry Would Continue To Get Smarter

Improving the components of diesel particulate filters is the current subject of research and development activities within the automotive and air pollution control industries. Aspects that are being improved include filter ash storage capacity, filter pressure drop, substrate durability, catalyst activity, as well as other physical and chemical properties that can optimize the device for heavy-duty vehicle applications.

Engine manufacturers have taken a systems approach, optimizing the engine with its after-treatment system to realize the best overall performance possible. Manufacturers can manage the functioning of the emission control system by adjusting parameters such as the thermal profile of the after-treatment system, the exhaust gas chemical composition, the rate of consumption of DEF, the rate of particle deposition, and the conditions under which DPF regenerations (soot cleaning) may occur.

In a broad and general sense, the trend is that DPF's are slowly becoming even more robust without EPA intervention. Future DPF's will need fewer total regenerations during the useful life of the engine and control system, more passive and fewer active regenerations will occur, and manual regenerations will become rarer.

In addition, vehicle operators and fleet managers will continue to become more experienced with this new generation of sophisticated electronically-controlled vehicles. Manufacturers across the country are providing training on actions fleet managers can take to decrease problems with DPF regenerations. These actions include:

- Use low-ash engine oils.
- Avoid extended idling.
- Maintain insulation on the exhaust pipe.
- Maintain the crankcase filter.
- Periodically operate a vehicle at higher speeds and loads.

The Technology & Maintenance Council (TMC) of the American Trucking Associations conducted a survey in late 2011 to compare user experiences between EPA 2010, EPA 2007, and EPA 2004 vintage trucks.[16] According to TMC, 72 percent of the survey respondents indicated that driver understanding of the 2007-vintage after-treatment system was worse than driver understanding of the 2004-vintage after-treatment system, and 33 percent of respondents indicated that driver understanding of the 2010-vintage after-treatment system was worse than driver understanding of the 2007-vintage after-treatment system. The responses regarding driver understanding of fault codes and dash lamps indicated that drivers have 69 percent poorer understanding of 2007 vs. 2004 fault codes and dash lamps, and 50 percent poorer understanding of 2010 vs. 2007 fault codes and dash lamps. We expect that this education component will gradually improve over time without EPA intervention.

(2) The Fleet Would Continue to Migrate to the 2010 Standards

Vehicles with 2010-compliant heavy-duty diesel engines tend to place different demands on their DPF systems than pre-2010 vehicles. With the addition of NO_X after-treatment such as SCR, engines may be tuned to emit lower engine-out PM (recall the NO_X-PM trade-off described above). When an SCR system is integrated, it provides the opportunity to run an engine at lower soot levels and elevated levels of NO_2, which is a chemical species that efficiently oxidizes the soot in the absence of elevated temperatures. It is EPA's expectation that vehicles of MY 2010 and beyond, particularly those using SCR, will generally experience fewer troubles with DPF's than the earlier model year vehicles, due to the nature of the on-board technology as well as the many years of experience gained by manufacturers since 2007. The 2011 TMC survey included an assessment of relative satisfaction levels between EPA 2010, EPA 2007, and EPA 2004 vintage trucks. The survey results indicate that after-treatment durability is better with EPA 2010 trucks compared to EPA 2007 trucks, with less time out of service.[17] As an illustration, according to a Volvo product brochure, the company's EPA 2010-compliant trucks eliminate the need for active DPF regeneration, reducing driver involvement with the emission control system, using a design that allows for the DPF system to reliably oxidize accumulated soot using continuous passive regeneration.[18]

(3) Some Trucks Would Continue to Experience Problems

Even though such trends would indicate that instances of emergency vehicles experiencing difficulty managing regeneration of DPF's would decrease, in the absence of this EPA action, some vehicles would be likely to continue to experience some problems.

EPA has learned that some engine manufacturers have disabled these engine protection measures on some emergency vehicles. In these cases the

[15] FAMA 2010, Emergency Vehicle SCR and DEF Inducement Guidelines; 2010 Engine Emissions Control Requirements.

[16] American Trucking Associations, Technology & Maintenance Council, S3 Engine Study Group. Survey conducted Fall 2011, public slides dated February 2012 available at *http://www.truckline.com/Federation/Councils/TMC/Documents/2012%20Annual%20Meeting%20and%20Exhibition%20Documents/TMC12A_TECH2.pdf.*

[17] *See* ATA/TMC, Note 16.

[18] *See* Volvo 2010 product brochure, ''Volvo's SCR No Regen Engine,'' available at *http://www.volvotrucks.com/SiteCollectionDocuments/VTNA_Tree/ILF/Products/2010/09-VTM075_NoRegen_SS_041609.pdf.*

manufacturer has reasoned that an operator should be allowed to remain in control of an emergency vehicle even facing risk of catastrophic failure, with the consequences of that failure being less severe than the consequences of the vehicle prematurely losing power, torque and/or speed while performing emergency services.

Without a clear action from EPA to provide the regulatory flexibility needed for swift deployment of robust remedies throughout the emergency vehicle fleet, implementation of best practices could be inconsistent, insufficient, or even impossible due to regulatory constraints. Some vehicles would continue to experience frequent plugging of DPF's, frequent forced filter regenerations, and reduced engine power, speed or torque that diminish the ability of first responders to save lives and property. There would also remain a heightened risk that an emergency vehicle could be taken out of service when it is most needed.

D. Regulatory Action

As described above in Section III.C, many DPF-equipped vehicles include engine controls and driver alerts that lead to decreases in maximum speed, torque, or power when DPF backpressure exceeds normal levels, as protective measures for either the engine or the DPF, or as inducements for the operator to immediately conduct DPF regeneration. Similarly, vehicles equipped with selective catalytic reduction (SCR) systems for NO_X reduction currently have engine controls and driver alerts that lead to eventual loss of speed, torque, or power when the SCR controls detect abnormal conditions (such as a malfunction, low DEF levels, etc.), as inducements to take immediate corrective action to allow the SCR to function normally. In most vehicles, these alerts and inducements may be easily avoided with normal driving and routine maintenance, and if activated, these inducements would not have any significant effect on public safety and welfare. In emergency vehicles, however, should any of these limits on maximum speed, torque, or power occur while a vehicle is responding to an emergency, it could be a matter of life or death. To address these issues that could otherwise limit the maximum speed, torque or power of an emergency vehicle's engine when it is needed most, EPA is proposing to amend 40 CFR part 86 to revise the definition of defeat device; add new definitions of emergency vehicle, ambulance and fire truck; and add new labeling requirements for new on-highway engines with approved Auxiliary Emission Control Devices for emergency vehicles. EPA is also amending its regulations at 40 CFR part 1039 to revise the definition of defeat device, add a new definition of emergency equipment, and add a new labeling requirement for nonroad engines with approved Auxiliary Emission Control Devices for emergency equipment.

In our current regulations, engine manufacturers may request as part of an application for new engine or vehicle certification, and EPA may approve, Auxiliary Emission Control Devices, if they are not determined to be ''defeat devices.'' Auxiliary Emission Control Devices, or AECD's, are any design element of an engine's emission control system that senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.[19] Some AECD's can temporarily decrease the effectiveness of an emission control system. This type of AECD is only permitted in very limited situations, for example, when such excursions are deemed to be necessary in order to protect the vehicle, engine, and or emission control system during limited modes of operation.

A defeat device is a type of AECD that reduces the effectiveness of vehicle emission controls in situations when such reduction in effectiveness is not approved or permitted by EPA. Defeat devices are not permitted by the Clean Air Act or EPA.

Approvals of AECD's are made by EPA on a case-by-case basis. In applications for engine certification, manufacturers must include a detailed description of each AECD to be installed in or on any vehicle (or engine) covered by the application, as well as a detailed justification of each AECD that results in a reduction in effectiveness of the emission control system. According to 40 CFR 86.094–21(b)(1)(i)(B), EPA may disapprove a request for an AECD based on consideration of currently available technology. Use of an unauthorized or disapproved AECD can be considered a violation of section 203 of the Act.[20]

In this action, EPA is proposing to revise the definition of *defeat device* at 40 CFR 86.004–2, 86.1803–01, and 40 CFR 1039.115 to exclude AECD's that apply only for engines on emergency vehicles, where the need for an AECD is justified in terms of preventing the vehicle or equipment from losing speed, torque, or power due to abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring during operation related to emergency response.

In this action, EPA is proposing to define an *emergency vehicle* as a vehicle that is an ambulance or a fire truck. EPA is proposing to adopt a definition of *ambulance* consistent with the current U.S. General Services Administration Star of Life specification.[21] EPA is proposing to define *fire truck* as a vehicle designed to be used under emergency conditions to transport personnel and equipment and to support the suppression of fires and mitigation of other hazardous situations, consistent with the scope of standards for automotive fire apparatus issued by the National Fire Protection Association.[22] We are defining *emergency equipment* as specialized vehicles to perform aircraft rescue and firefighting functions at airports, or wildland fire apparatus. With these definitions, it is EPA's intent to include vehicles that are purpose-built and exclusively dedicated to firefighting, emergency/rescue medical transport, and/or performing other rescue or emergency personnel or equipment transport functions related to saving lives and reducing injuries coincident with fires and other hazardous situations. EPA requests comment on whether we should refine or expand our definition of emergency vehicle within the scope of this action to include those equipped with heavy-duty diesel engines that serve other civilian rescue, law enforcement or emergency response functions. We are especially interested in information regarding instances of such vehicles experiencing or risking loss of power, speed or torque due to abnormal conditions of the emission control system, and how that may inhibit mission-critical life- and property-saving work.

EPA is also adopting an associated engine labeling requirement so that engines with approved emergency vehicle AECD's will be clearly identified and distinguished from other similar engines.

As mentioned above in Section III.B, some engine manufacturers currently specify that when an engine is sold for installation in an emergency vehicle,

[19] *See* 40 CFR 86.082–2 .

[20] *See* 40 CFR 86.094–21 and 094–22.

[21] U.S. General Services Administration, Federal Specification for the Star-of-Life Ambulance, August 1, 2007, *http://www.deltaveh.com/f.pdf.*

[22] *See* National Fire Protection Association Web page. Accessed April 2012 at *http://www.nfpa.org/catalog/product.asp?title=Code-1901-2009-Automotive-Fire-Apparatus&category%5Fname=&pid=190109&target%5Fpid=190109&src%5Fpid=&link%5Ftype=search&icid=.*

some of the default power, torque or speed inducements be de-activated or set to alternate, less severe settings. In such applications, when the DPF system requests regeneration, the warning lights remain illuminated while the vehicle remains in complete control of the driver. In these cases the manufacturer has likely reasoned that the consequences of catastrophic failure would be less severe than the consequences of the vehicle prematurely losing power, torque and/or speed while performing emergency services. EPA has granted related AECD's in the past.

However, without the optional flexibilities provided by EPA in this action, manufacturers could be prevented from implementing truly failsafe solutions for all affected vehicles. For example, while current custom solutions may allow an emergency vehicle to continue pumping water or transporting a person to safety, its DPF would continue to accumulate particles and the risk of catastrophic failure would increase.

In this action, EPA is adopting amendments so that manufacturers can apply for (and EPA can approve) AECD's that may be justified in terms of preventing the occurrence of abnormal conditions of the emission control systems for emergency vehicles or in terms of preventing the engines from losing speed, torque, or power due to such abnormal conditions. In this context, EPA would consider abnormal conditions to be parameters outside normal ranges for proper operation, such as excessive exhaust backpressure from high soot loading on a DPF or insufficient DEF for use with an SCR system.

EPA is encouraging manufacturers to apply for AECD's that are tailored for engines on emergency vehicles, considering the duty cycle information presented in the accompanying NPRM, along with any other information needed to design failsafe emission control systems for new emergency vehicles. EPA is also encouraging manufacturers to design field modifications to address these issues on in-use emergency vehicles, including those whose engines are no longer in production. Further discussion of field modifications is provided below in Section III.E(2).

To achieve these goals, EPA understands that increased flexibility will be needed because EPA's strict NO_X and PM standards present many design constraints. Below we describe some solutions that EPA believes it could approve as part of an emergency vehicle AECD or field modification, as adopted. EPA is encouraging engine manufacturers to apply for emergency vehicle AECD's and/or field modifications for in-use emergency vehicles for which service disruptions related to abnormal conditions of emission control systems may occur or have occurred. EPA suggests that such AECD's or field modifications could include, but are not limited to, one or more of the following strategies:

(1) Liberalized Regeneration Requests

It is current practice that most modern diesel engine ECM's are set to initiate an automatic active regeneration only above a designated DPF soot load, and those vehicles equipped with manual regeneration switches are set to not allow the option of initiating manual active regeneration until an even greater soot load is detected. The reason why manufacturers do this is related to certification of engine families and vehicle test groups. If manufacturers can limit the frequency of regenerations by design, then they can be assured that average emissions will remain below the certified average emission level. Excess regenerations could lead to higher average emissions, since some exhaust emissions increase during regeneration. Particularly for engines not equipped with SCR systems, NO_X emissions can increase by an order of magnitude during regeneration, and these temporary increases in emission are accounted for in EPA's certification process. See the accompanying NPRM for more information about the emissions impacts of DPF regenerations. In addition, excess regenerations could shorten the useful life of the DPF system since high temperatures place stress on filter substrates.

EPA believes that emergency vehicle AECD's that enable more frequent automatic active and manual active DPF regenerations, associated with a wider range of soot loads could improve the reliability of DPF systems without significantly compromising emissions reductions or durability. As explained below Section III.E(4), EPA does not expect this provision to affect other aspects of certification. For emergency vehicles with approved AECD's that involve changes in the frequency of regeneration, the resulting increase in NO_X emissions will not be counted against certification levels for applicable engine families or vehicle test groups. Furthermore, emissions certification testing may be conducted with any approved AECD's for emergency vehicle or equipment deactivated. According to EPA's current engine certification data, engines from MYs 2008 and 2011 have an average maximum automatic active regeneration frequency near 20 percent, with the typical frequency between three and seven percent. Those with frequencies near zero rely almost exclusively on passive regeneration.[23]

(2) Engine Recalibration

As mentioned above, in-cylinder combustion chemistry dictates a NO_X-PM trade-off where engines calibrated to reduce in-cylinder NO_X tend to have higher PM levels. These factors lead to higher rates of particle accumulation and lower rates of particle oxidation on filters. EPA believes that AECD's that incorporate engine calibration modifications could enable operation in a ''low soot mode'' with a reduced rate of particle deposition that would lead to more frequent and effective passive regenerations. Such calibration modifications could also extend the operating time between all types of regenerations, improve active regeneration effectiveness, and boost reliability of the DPF systems. On engines with downstream (i.e., SCR) NO_X controls, SCR control could be modulated such that engine recalibration would not significantly affect NO_X emissions. On engines without downstream NO_X controls, EPA believes that some degree of increased NO_X emissions during the conditions justified by the AECD would be approvable for emergency vehicles. As explained below in Section III.E(4), EPA does not expect this provision to affect other aspects of certification. When manufacturers calculate the average NO_X emissions during a test cycle, they incorporate data regarding both the frequency of regeneration and the increase in NO_X emissions during regeneration. For emergency vehicles with approved AECD's that involve recalibration to alter regeneration frequency or average NO_X emissions, the resulting increase in NO_X emissions will not be counted against certification levels for applicable engine families or vehicle test groups. Furthermore, emissions certification testing may be conducted with any approved AECD's for emergency vehicle or equipment deactivated. A discussion of the estimated emissions impacts of recalibration is provided in the Notice of Proposed Rulemaking published elsewhere in today's **Federal Register**.

(3) Backpressure Relief

It is EPA's objective that all of our clean diesel emissions standards be implemented with reliable technologies

[23] Frequency in percent refers to the fraction of engine test cycles during which an automatic active regeneration occurs.

that require a minimum amount of driver intervention and do not compromise the utility of vehicles. EPA understands that manufacturers are motivated to seek design solutions that are cost effective and easily deployable. However, by focusing solely on preventive measures such as those described above, manufacturers may not achieve a completely failsafe DPF strategy on all emergency vehicles. EPA anticipates that some vehicles may benefit from an additional failsafe measure that relieves engine exhaust backpressure as a last resort to prevent loss of engine speed, torque or power. There are products on the market today that could be configured to temporarily relieve excessive engine exhaust backpressure when detected, then return the system to normal at the instant that backpressure returns to a safe level. Such a device may be justified as a failsafe measure, and may be included as part of an overall strategy that also includes preventive measures, if justified and properly limited, where excess PM emissions would be expected to be emitted only during a small fraction of vehicle operation. That is, the vast majority of DPF operating cycles would be expected to have continuous PM emission control, while any temporary backpressure relief that reduced PM control or allowed bypass of controls would be expected relatively infrequently.

E. What engines and vehicles are affected?

Today's action applies to new and in-use fire trucks and ambulances, new and in-use airport fire apparatus and wildland fire apparatus, and heavy-duty diesel engines on these emergency vehicles and equipment.

(1) Newly Certified Engines

Of those new diesel engines covered by EPA's current heavy-duty diesel standards, only those installed in vehicles or equipment meeting the definition of emergency vehicle or emergency equipment will be eligible to obtain an approved AECD of the type discussed above in Section III.D. Where a vehicle is chassis-certified and either sold as an incomplete vehicle to a truck body manufacturer or built and sold as a complete vehicle, only those sold and built as emergency vehicles will be eligible to obtain an approved AECD of the type discussed above.

(2) Certified Engines and Vehicles In-Use

To address in-use engines and vehicles, EPA plans to allow engine and vehicle manufacturers to submit requests for EPA approval of Emergency Vehicle Field Modifications (EVFMs) for on-highway emergency vehicles and Emergency Equipment Field Modifications (EEFMs) for nonroad emergency equipment. EVFMs and EEFMs will be modifications to existing hardware and software to be installed on in-use vehicles or equipment to prevent loss of speed, torque, or power due to abnormal conditions of emission control systems, or to prevent such abnormal conditions from occurring, during vehicle or equipment operation related to emergency response. EPA will use an approval process similar to the process that is currently utilized to submit modifications to current applications for certification, also known as ''running changes.'' The information submitted by a manufacturer to EPA as part of this request and approval process will be similar to the information submitted for emergency vehicle or equipment AECD's.

It is important to emphasize that this action will allow only those approved modifications to be deployed by manufacturers and their authorized dealers. Modifications made by end users are not generally approvable; rather the tampering prohibitions would generally apply to such modifications.

EPA has identified three types of field modifications that will be permitted for emergency vehicles and emergency equipment under the final regulations, based on the extent to which the modification is being incorporated into new production vehicles and equipment. The three types are:

☐ Type A: Any field modification that is a change to a certified vehicle (i.e., a vehicle, engine or equipment covered by a certificate of conformity) that is identical in all respects to a running change that is approved for incorporation in new vehicles by the manufacturer. Where the running change was approved by EPA for implementation only in conjunction with certain other running changes, the field modification may be considered to be a Type A field modification only if implemented under the same constraints.

☐ Type B: Any field modification that is not identical in all respects to, but provides for essentially the same purpose as, a running change that is being incorporated in new vehicles by the manufacturer or that would have been incorporated if the vehicle were still in production. A Type B field modification is used when it is not practical to incorporate the exact running change in vehicles that have left the assembly line, or when the vehicles are no longer in production.

☐ Type C: Any field modification that is made selectively only to vehicles which have left the assembly line and which would not have been incorporated on the assembly line. For example, this would apply when making a field modification to a vehicle that is no longer in production where there are no similar vehicles in production.

The amount of justification needed for the field modification differs depending on which type of modification is being requested.

(3) Labeling Requirements

Because the engines and vehicles eligible for the AECD's described in this proposal belong to broadly certified engine families and test groups, when they are sold for installation in an emergency vehicle and equipped with one or more approved emergency vehicle AECD's, they must be labeled as such, to distinguish them from other certified engines. EPA is proposing adding a labeling requirement to 40 CFR part 86 subpart A, such that engines with one or more approved AECD's for emergency vehicle applications must be labeled with the statement: ''THIS ENGINE IS FOR INSTALLATION IN EMERGENCY VEHICLES ONLY.'' EPA is also proposing adding a labeling requirement to 40 CFR part 86 subpart S, such that vehicles with one or more approved AECD's for emergency vehicles, include the following statement on the emission control information label: ''THIS VEHICLE HAS A LIMITED EXEMPTION AS AN EMERGENCY VEHICLE.'' EPA is also adding a labeling requirement to 40 CFR part 1039, such that nonroad engines with one or more approved AECD's for emergency equipment include a label with the following statement: ''THIS ENGINE IS FOR INSTALLATION IN EMERGENCY EQUIPMENT ONLY.''

EPA requests comment on whether these labeling requirements are satisfactory to ensure that engines and vehicles operating with approved emergency AECD's are permanently distinguished from similar certified engines. EPA also requests comment on whether a similar label should be required for an in-use emergency vehicle or equipment where a field modification is deployed that prevents the engine from losing speed, torque, or power due to any occurrences of abnormal conditions of the emission control system, or prevents such abnormal conditions from occurring.

(4) Other Regulatory Provisions

Today's rule will not alter the tampering prohibition in 40 CFR 1068.101(b)(1). This provision describes a general prohibition against anyone from removing or rendering inoperative an engine's emission controls before or after entering into service, where an exception is provided in 1068.101(b)(1)(ii) for engine modifications needed to respond to a temporary emergency, provided that the engine is restored to proper functioning as soon as possible after the emergency has passed. EPA encourages manufacturers to design their emergency vehicle AECD's to be engaged only to the extent necessary to prevent the engine from losing speed, torque, or power due to abnormal conditions of the emission control system, or to prevent such abnormal conditions from occurring during operation related to emergency response. EPA recognizes that there may be cases where an AECD may need to be engaged at times other than while actively responding to an emergency, in order to assure that loss of speed, torque or power does not occur during operation related to emergency response. EPA also recognizes that some AECD's may involve electronic approaches where the engine's functions would be modulated based on exhaust backpressure or other parameters that are not correlated with any emergency situation. EPA may even, in extreme cases, such as at high altitude or with certain older MY engines allow engagement of AECD's at all times, if they are justified as necessary to prevent engine from losing speed, torque, or power during operation related to emergency response.

We are also encouraging manufacturers to design their emission control systems to discourage tampering. According to EPA's tampering prohibition, a vehicle operator who abuses or alters an approved AECD may be guilty of tampering. For example, if an AECD includes enabling an operator to initiate more frequent manual active regenerations, engine manufacturers may choose to prevent the abuse of this function by means such as a daily or weekly cap on the number of manual active regenerations, or a minimum soot loading for the function to engage. As another example, if an emergency vehicle alerts a driver to an abnormal condition of its emission control system by illuminating dash lamps, alarms or other warnings that do not limit vehicle performance, it is the operator's responsibility to take prompt action to remedy the problem.[24] If an operator disregards such warnings beyond the time needed to respond to the emergency, this may be considered tampering. It is important to note that if an emergency vehicle is not equipped to ever allow an operator to initiate a manual active regeneration, this may in practice encourage tampering by the end user.

Manufacturers of highway and nonroad engines will be required to describe any emergency vehicle AECD in an application for certification. In this action, we are not proposing any revisions to the information needed to review and approve AECD's. It is common practice for manufacturers, in describing AECD's, to identify engine parameters such as those that would operate differently to preserve adequate engine performance during an emergency, including information about how the engine would respond under different in-use operating conditions under the various sets of conditions that would otherwise cause the engine to operate at less than full performance levels. Other than the requirement for a manufacturer to describe the emergency vehicle AECD in its application for certification, we do not expect this provision to be relevant for other aspects of certification. For example, emissions certification testing may be conducted with any approved AECD's for emergency vehicle or equipment deactivated. Additionally, manufacturers do not need to consider emergency vehicle AECD's when developing infrequent regeneration adjustment factors (IRAFs) or when developing deterioration factors (DFs). Thus, manufacturers can include emergency and non-emergency engines and vehicles in the same engine families and test groups. Manufacturers may also apply for emergency vehicle AECD's for new, existing, and/or formerly approved emissions certificates.

F. Economic Impacts

EPA expects the economic effects of this rule to be small, and to potentially have benefits that are a natural result of easing constraints.

(1) Costs to Manufacturers

Due to the optional and voluntary nature of this action, there are no direct regulatory compliance costs to engine manufacturers. To the extent manufacturers elect to develop and deploy upgrades to engines for emergency vehicles, they may voluntarily incur some degree of costs associated with the following:

- Design and testing to determine effectiveness of potential AECDs
- Education & outreach to intermediate vehicle manufacturers and end users
- Deployment of AECDs onto new and in-use emergency vehicles
- Labeling costs

EPA expects any fixed costs will be small, and any variable costs will apply only to the engines sold for installation in emergency vehicles or emergency equipment, which comprise less than one percent of the heavy-duty on-road fleet, and an even smaller fraction of the nonroad fleet. As per standard practice, manufacturers would be free to set a fair market price for any approved AECD they offer, to offset the costs incurred in its development.

(2) Operational Costs

Depending on the type of AECD or field modification that a manufacturer voluntarily elects to deploy, some operational costs could increase and some could decrease.

When an emergency vehicle is experiencing frequent plugging of its DPF, this increases maintenance costs for owners and warranty costs for manufacturers. These costs are expected to decrease with this action. Furthermore, EPA believes that the potential for reduced warranty costs may help to offset the cost to produce and deploy any optional AECD's. Similarly, EPA believes the potential for reduced maintenance and operational costs may offset the cost to owners for obtaining requested AECD's.

Where DPF systems employ fuel dosing to enable active automatic regenerations, it is uncertain whether liberalizing the parameters for initiating regenerations would affect fuel consumption, and whether fuel consumption would increase with an increased number of regenerations during a given operating period. To the extent regenerations are enabled with other means besides fuel, or demand for regenerations is reduced through recalibration, then any potential increase in fuel use from dosing would be mitigated. Further discussion of operational costs including costs of fuel dosing is provided in the Notice of Proposed Rulemaking published elsewhere in Today's **Federal Register**.

[24] Although this action will not affect certification of engine families or test groups, EPA's regulations do offer options to manufacturers who wish to ensure that emission-related maintenance will occur in use, including visible signals that are not reset until maintenance occurs. 40 CFR 86.004–25(b)(6)(ii).

(3) Societal Costs

Because this rule eases constraints on the development of robust DPF systems, the economic impacts can only improve with this action. It is presumed that the benefits to society of enabling first responders to act quickly when needed outweigh the costs to society of the temporary increase in emissions from this small segment of vehicles.

G. Environmental Impacts

We expect any environmental impacts from this action will be small. By promulgating these amendments, it is expected that the emissions from this segment of the heavy-duty fleet will not change significantly.

EPA estimates that on-road emergency vehicles comprise less than one percent of the national heavy-duty fleet. According to the International Council on Clean Transportation (ICCT), less than one percent of all new heavy-duty truck registrations in 2003 to 2007 were for emergency vehicles (includes class 8 fire trucks plus other class 3–8 emergency vehicles).[25] On average, the ICCT's data suggest that approximately 5,700 new emergency vehicles are sold in the U.S. each year; about 0.8 percent of the 3.4 million new heavy-duty trucks registered between 2003 and 2007. The available information indicates that the emergency vehicles included in the scope of this rulemaking have lower annual vehicle miles traveled than average non-emergency vehicles. Therefore, we conclude that they contribute less than 1% of the annual air emissions from the heavy-duty diesel truck fleet.

Due to the optional and voluntary nature of this action, it is difficult to estimate its overall emissions impact accurately. The amendments offer many options to manufacturers, and the emissions impacts will depend on which options and strategies are employed, and for how many vehicles. Further discussions of potential NO_X and PM emissions impacts and fuel consumption from dosing are provided in the Notice of Proposed Rulemaking published elsewhere in Today's **Federal Register**.

H. Health Effects

EPA's clean diesel standards are already providing substantial benefits to public health and welfare and the environment through significant reductions in emissions of NO_X, PM, nonmethane hydrocarbons (NMHC), carbon monoxide, sulfur oxides (SO_X), and air toxics. We project that by 2030, the on-highway program alone will reduce annual emissions of NO_X, NMHC, and PM by 2.6 million, 115,000 and 109,000 tons, respectively. These emission reductions will prevent 8,300 premature deaths, over 9,500 hospitalizations, and 1.5 million work days lost. All told, the monetized benefits of the on-highway rule plus the nonroad diesel Tier 4 rule total over $150 billion. A sizeable part of the benefits in the early years of these programs has come from large reductions in the amount of direct and secondary PM emitted by the existing fleet of heavy-duty engines and vehicles, by requiring the use of the higher quality diesel fuel in these vehicles. While this final action may slightly increase some emissions, as explained in the previous section, we do not expect that these small increases will significantly diminish the health benefits of our stringent clean diesel standards.

[25] ICCT, May 2009, ''Heavy-Duty Vehicle Market Analysis: Vehicle Characteristics & Fuel Use, Manufacturer Market Shares.''

IV. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

This action is not a ''significant regulatory action'' under the terms of Executive Order (EO) 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

B. Paperwork Reduction Act

This action does not impose any new information collection burden. The regulatory relief for emergency vehicles is voluntary and optional, and the revisions for engine and vehicle maintenance merely codify existing guidelines. However, the Office of Management and Budget (OMB) has previously approved the information collection requirements contained in the existing regulations under the provisions of the *Paperwork Reduction Act,* 44 U.S.C. 3501 et seq. and has assigned OMB Control Numbers 2060–0104 and 2060–0287. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

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

For purposes of assessing the impacts of this rule on small entities, small entity is defined as: (1) A small business primarily engaged in shipbuilding and repairing as defined by NAICS code 336611 with 1,000 or fewer employees (based on Small Business Administration size standards); (2) a small business that is primarily engaged in freight or passenger transportation on the Great Lakes as defined by NAICS codes 483113 and 483114 with 500 or fewer employees (based on Small Business Administration size standards); (3) a small business primarily engaged in commercial and industrial machinery and equipment repair and maintenance as defined by NAICS code 811310 with annual receipts less than $7 million (based on Small Business Administration size standards); (4) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (5) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's rule on small entities, I certify that this final rule will not have a significant economic impact on a substantial number of small entities.

In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives ''which minimize any significant economic impact of the rule on small entities.'' 5 U.S.C. 603 and 604. Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

This rule provides regulatory relief related to emergency vehicles. As such, we anticipate no costs and therefore no regulatory burden associated with this rule. We have concluded that this rule will not increase regulatory burden for affected small entities.

D. Unfunded Mandates Reform Act

This action contains no Federal mandates under the provisions of Title II of the Unfunded Mandates Reform

Act of 1995 (UMRA), 2 U.S.C. 1531–1538 for State, local, or tribal governments or the private sector. The action imposes no enforceable duty on any State, local or tribal governments or the private sector. This direct final rule offers manufacturers the flexibility to choose whether to use optional AECD's based on their strategies for complying with the applicable emissions standards. Therefore, this action is not subject to the requirements of sections 202 or 205 of the UMRA.

This action is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This direct final rule applies to manufacturers of heavy-duty diesel engines and not to state or local governments. Thus, Executive Order 13132 does not apply to this action.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This direct final rule will be implemented at the Federal level and may result in indirect costs on affected engine manufacturers depending on the extent to which they take advantage of the flexibilities offered. Tribal governments will be affected only to the extent they purchase and use vehicles with regulated engines. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045: ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the agency.

EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5–501 of the Order has the potential to influence the regulation. This direct final rule is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks, and because it is not economically significant under Executive Order 12866.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this direct final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations. This action is not expected to have any adverse environmental impacts.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A Major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective on August 7, 2012.

List of Subjects

40 CFR Part 85

Confidential business information, Imports, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements, Research, Warranties.

40 CFR Part 86

Administrative practice and procedure, Confidential business information, Motor vehicle pollution, Reporting and recordkeeping requirements.

40 CFR Part 1039

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

Dated: May 23, 2012.

Lisa P. Jackson,

Administrator.

For the reasons set forth in the preamble, the Environmental Protection Agency amends title 40, chapter I of the Code of Federal Regulations as follows:

PART 85—CONTROL OF AIR POLLUTION FROM MOBILE SOURCES

■ 1. The authority citation for part 85 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart R—[Amended]

■ 2. Add § 85.1716 to subpart R to read as follows:

§ 85.1716 Approval of an emergency vehicle field modification (EVFM).

This section describes how you may implement design changes for an emergency vehicle that has already been placed into service to ensure that the vehicle will perform properly in emergency situations. This applies for any light-duty vehicle, light-duty truck, or heavy-duty vehicle meeting the definition of *emergency vehicle* in 40 CFR 86.004–2 or 86.1803. In this section, ''you'' refers to the certifying manufacturer and ''we'' refers to the EPA Administrator and any authorized representatives.

(a) You must notify us in writing of your intent to install or distribute an emergency vehicle field modification (EVFM). In some cases you may install or distribute an EVFM only with our advance approval, as specified in this section.

(b) Include in your notification a full description of the EVFM and any documentation to support your determination that the EVFM is necessary to prevent the vehicle from losing speed, torque, or power due to abnormal conditions of its emission control system, or to prevent such abnormal conditions from occurring during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, or running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction. Your determination must be based on an engineering evaluation or testing or both.

(c) You may need our advance approval for your EVFM, as follows:

(1) Where the proposed EVFM is identical to an AECD we approved under this part for an engine family currently in production, no approval of the proposed EVFM is necessary.

(2) Where the proposed EVFM is for an engine family currently in production but the applicable demonstration is based on an AECD we approved under this part for an engine family no longer in production, you must describe to us how your proposed EVFM differs from the approved AECD. Unless we say otherwise, your proposed EVFM is deemed approved 30 days after you notify us.

(3) If we have not approved an EVFM comparable to the one you are proposing, you must get our approval before installing or distributing it. In this case, we may request additional information to support your determination under paragraph (b) of this section, as follows:

(i) If we request additional information and you do not provide it within 30 days after we ask, we may deem that you have retracted your request for our approval; however, we may extend this deadline for submitting the additional information.

(ii) We will deny your request if we determine that the EVFM is not necessary to prevent the vehicle from losing speed, torque, or power due abnormal conditions of the emission control system, or to prevent such abnormal conditions from occurring, during operation related to emergency response.

(iii) Unless we say otherwise, your proposed EVFM is deemed approved 30 days after we acknowledge that you have provided us with all the additional information we have specified.

(4) If your proposed EVFM is deemed to be approved under paragraph (c)(2) or (3) of this section and we find later that your EVFM in fact does not meet the requirements of this section, we may require you to no longer install or distribute it.

PART 86—CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

■ 3. The authority citation for part 86 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 4. Section 86.004–2 is amended as follows:

■ a. By adding a definition for ''Ambulance'' in alphabetical order.

■ b. By revising the definition for ''Defeat device''.

■ c. By adding definitions for ''Diesel exhaust fluid'', ''Emergency vehicle'', and ''Fire truck'' in alphabetical order.

The additions and revision read as follows:

§ 86.004–2 Definitions.

* * * * *

Ambulance has the meaning given in § 86.1803.

Defeat device means an auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless:

(1) Such conditions are substantially included in the applicable Federal emission test procedure for heavy-duty vehicles and heavy-duty engines described in subpart N of this part;

(2) The need for the AECD is justified in terms of protecting the vehicle against damage or accident;

(3) The AECD does not go beyond the requirements of engine starting; or

(4) The AECD applies only for engines that will be installed in *emergency vehicles,* and the need is justified in terms of preventing the engine from losing speed, torque, or power due abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction.

Diesel exhaust fluid (DEF) has the meaning given in § 86.1803.

Emergency vehicle means a vehicle that is an ambulance or a fire truck.

Fire truck has the meaning given in § 86.1803.

* * * * *

■ 5. Section 86.004–28 is amended by revising paragraph (i) introductory text to read as follows:

§ 86.004–28 Compliance with emission standards.

* * * * *

(i) Emission results from heavy-duty engines equipped with exhaust aftertreatment may need to be adjusted to account for regeneration events. This provision only applies for engines equipped with emission controls that are regenerated on an infrequent basis. For the purpose of this paragraph (i), the term ''regeneration'' means an event during which emission levels change while the aftertreatment performance is being restored by design. Examples of regenerations are increasing exhaust gas temperature to remove sulfur from an adsorber or increasing exhaust gas temperature to oxidize PM in a trap. For the purpose of this paragraph (i), the term ''infrequent'' means having an expected frequency of less than once per transient test cycle. Calculation and use of adjustment factors are described in paragraphs (i)(1) through (5) of this section. If your engine family includes engines with one or more AECDs for emergency vehicle applications approved under paragraph (4) of the definition of defeat device, do not consider additional regenerations resulting from those AECDs when calculating emission factors or frequencies under this paragraph (i).

* * * * *

■ 6. Section 86.095–35 is amended by revising paragraph (a)(3)(iii)(O) to read as follows:

§ 86.095–35 Labeling.

(a) * * *

(3) * * *

(iii) * * *

(O) For engines with one or more approved AECDs for emergency vehicle applications under paragraph (4) of the definition of ''defeat device'' in § 86.004–2, the statement: ''THIS ENGINE IS FOR INSTALLATION IN EMERGENCY VEHICLES ONLY.''

* * * * *

Subpart B—[Amended]

■ 7. Section 86.131–00 is amended by adding paragraph (g) to read as follows:

§ 86.131–00 Vehicle preparation.

(g) You may disable any AECDs that have been approved solely for emergency vehicle applications under paragraph (4) of the definition of defeat device. The emission standards do not apply when any of these AECDs are active.

Subpart N—[Amended]

■ 8. Section 86.1305–2010 is amended by adding paragraph (i) to read as follows:

§ 86.1305–2010 Introduction; structure of subpart.

* * * * *

(i) You may disable any AECDs that have been approved solely for emergency vehicle applications under paragraph (4) of the definition of ''defeat device'' in § 86.004–2. The emission standards do not apply when any of these AECDs are active.

■ 9. Section 86.1370–2007 is amended by adding paragraph (h) to read as follows:

§ 86.1370–2007 Not-To-Exceed test procedures.

* * * * *

(h) *Emergency vehicle AECDs.* If your engine family includes engines with one or more approved AECDs for emergency vehicle applications under paragraph (4) of the definition of ''defeat device'' in § 86.1803, the NTE emission limits do not apply when any of these AECDs are active.

Subpart S—[Amended]

■ 10. Section 86.1803–01 is amended as follows:

■ a. By adding a definition for ''Ambulance'' in alphabetical order.

■ b. By revising the definition for ''Defeat device''.

■ c. By adding definitions for ''Diesel exhaust fluid'', ''Emergency vehicle'', and ''Fire truck'' in alphabetical order.

§ 86.1803–01 Definitions.

* * * * *

Ambulance means a vehicle used for emergency medical care that provides all of the following:

(1) A driver's compartment.

(2) A patient compartment to accommodate an emergency medical services provider and one patient located on the primary cot so positioned that the primary patient can be given intensive life-support during transit.

(3) Equipment and supplies for emergency care at the scene as well as during transport.

(4) Safety, comfort, and avoidance of aggravation of the patient's injury or illness.

(5) Two-way radio communication.

(6) Audible and visual traffic warning devices.

* * * * *

Defeat device means an auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless:

(1) Such conditions are substantially included in the Federal emission test procedure;

(2) The need for the AECD is justified in terms of protecting the vehicle against damage or accident;

(3) The AECD does not go beyond the requirements of engine starting; or

(4) The AECD applies only for *emergency vehicles* and the need is justified in terms of preventing the vehicle from losing speed, torque, or power due to abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction.

* * * * *

Diesel exhaust fluid (DEF) means a liquid compound used in conjunction with selective catalytic reduction to reduce NO_X emissions. *Diesel exhaust fluid* is generally understood to conform to the specifications of ISO 22241.

* * * * *

Emergency vehicle means a vehicle that is an ambulance or a fire truck.

* * * * *

Fire truck means a vehicle designed to be used under emergency conditions to transport personnel and equipment and to support the suppression of fires and mitigation of other hazardous situations.

* * * * *

■ 11. Section 86.1807–01 is amended by adding paragraphs (h) and (i) to read as follows:

§ 86.1807–01 Vehicle labeling.

* * * * *

(h) Vehicles powered by model year 2007 through 2013 diesel-fueled engines must include permanent readily visible labels on the dashboard (or instrument panel) and near all fuel inlets that state ''Use Ultra Low Sulfur Diesel Fuel Only'' or ''Ultra Low Sulfur Diesel Fuel Only''.

(i) For vehicles with one or more approved AECDs for emergency vehicles under paragraph (4) of the definition of ''defeat device'' in § 86.1803, include the following statement on the emission control information label: ''THIS VEHICLE HAS A LIMITED EXEMPTION AS AN EMERGENCY VEHICLE.''

§ 86.1807–07 [Removed]

■ 12. Subpart S is amended by removing § 86.1807–07.

■ 13. Section 86.1840–01 is amended by revising paragraph (c) to read as follows:

§ 86.1840–01 Special test procedures.

* * * * *

(c) Manufacturers of vehicles equipped with periodically regenerating aftertreatment devices must propose a procedure for testing and certifying such vehicles, including SFTP testing, for the review and approval of the Administrator. The manufacturer must submit its proposal before it begins any service accumulation or emission testing. The manufacturer must provide with its submittal sufficient documentation and data for the Administrator to fully evaluate the operation of the aftertreatment devices and the proposed certification and testing procedure.

* * * * *

PART 1039—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES

■ 14. The authority citation for part 1039 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart B—[Amended]

■ 15. Section 1039.115 is amended by adding paragraphs (g)(4) and (5) to read as follows:

§ 1039.115 What other requirements apply?

* * * * *

(g) * * *

(4) The auxiliary emission control device applies only for engines that will be installed in emergency equipment and the need is justified in terms of preventing the equipment from losing speed or power due to abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction. The emission standards do not apply when any AECDs approved under this paragraph (g)(4) are active.

(5) The auxiliary emission control device operates only in emergency situations as defined in § 1039.665 and meets all of the requirements of that section, and you meet all of the requirements of that section.

■ 16. Section 1039.135 is amended by adding paragraph (c)(15) to read as follows:

§ 1039.135 How must I label and identify the engines I produce?

* * * * *

(c) * * *

(15) For engines with one or more approved auxiliary emission control devices for emergency equipment applications under § 1039.115(g)(4), the statement: ''THIS ENGINE IS FOR INSTALLATION IN EMERGENCY EQUIPMENT ONLY.''

* * * * *

Subpart F—[Amended]

■ 17.Section 1039.501 is amended by adding paragraph (g) to read as follows:

§ 1039.501 How do I run a valid emission test?

* * * * *

(g) You may disable any AECDs that have been approved solely for emergency equipment applications under § 1039.115(g)(4).

■ 18.Section 1039.525 is amended by revising the introductory text to read as follows:

§ 1039.525 How do I adjust emission levels to account for infrequently regenerating aftertreatment devices?

This section describes how to adjust emission results from engines using aftertreatment technology with infrequent regeneration events. For this section, ''regeneration'' means an intended event during which emission levels change while the system restores aftertreatment performance. For example, exhaust gas temperatures may increase temporarily to remove sulfur from adsorbers or to oxidize accumulated particulate matter in a trap. For this section, ''infrequent'' refers to regeneration events that are expected to occur on average less than once over the applicable transient duty cycle or ramped-modal cycle, or on average less than once per typical mode in a discrete-mode test. If your engine family includes engines with one or more AECDs for emergency equipment applications approved under § 1039.115(g)(4), do not consider additional regenerations resulting from those AECDs when calculating emission factors or frequencies under this section.

* * * * *

Subpart G—[Amended]

■ 19. Add § 1039.670 to subpart G to read as follows:

§ 1039.670 Approval of an emergency equipment field modification (EEFM).

This section describes how you may implement design changes for emergency equipment that has already been placed into service to ensure that the equipment will perform properly in emergency situations.

(a) You must notify us in writing of your intent to install or distribute an emergency equipment field modification (EEFM). In some cases you may install or distribute an EEFM only with our advance approval, as specified in this section.

(b) Include in your notification a full description of the EEFM and any documentation to support your determination that the EEFM is necessary to prevent the equipment from losing speed, torque, or power due to abnormal conditions of its emission control system, or to prevent such abnormal conditions from occurring during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, or running out of diesel exhaust fluid (DEF) for engines that rely on urea-based selective catalytic reduction. Your determination must be based on an engineering evaluation or testing or both.

(c) You may need our advance approval for your EEFM, as follows:

(1) Where the proposed EEFM is identical to an AECD we approved under this part for an engine family currently in production, no approval of the proposed EEFM is necessary.

(2) Where the proposed EEFM is for an engine family currently in production but the applicable demonstration is based on an AECD we approved under this part for an engine family no longer in production, you must describe to us how your proposed EEFM differs from the approved AECD. Unless we say otherwise, your proposed EEFM is deemed approved 30 days after you notify us.

(3) If we have not approved an EEFM comparable to the one you are proposing, you must get our approval before installing or distributing it. In this case, we may request additional information to support your determination under paragraph (b) of this section, as follows:

(i) If we request additional information and you do not provide it within 30 days after we ask, we may deem that you have retracted your request for our approval; however, we may extend this deadline for submitting the additional information.

(ii) We will deny your request if we determine that the EEFM is not necessary to prevent the equipment from losing speed, torque, or power due abnormal conditions of the emission control system, or to prevent such abnormal conditions from occurring, during operation related to emergency response.

(iii) Unless we say otherwise, your proposed EEFM is deemed approved 30 days after we acknowledge that you have provided us with all the additional information we have specified.

(4) If your proposed EEFM is deemed to be approved under paragraph (c)(2) or (3) of this section and we find later that your EEFM in fact does not meet the requirements of this section, we may require you to no longer install or distribute it.

Subpart I—[Amended]

■ 20. Section 1039.801 is amended by adding definitions for ''Diesel exhaust fluid'' and ''Emergency equipment'' in alphabetical order to read as follows:

§ 1039.801 What definitions apply to this part?

* * * * *

Diesel exhaust fluid (DEF) means a liquid compound used in conjunction with selective catalytic reduction to reduce NO_X emissions. *Diesel exhaust fluid* is generally understood to conform to the specifications of ISO 22241.

* * * * *

Emergency equipment means either of the following types of equipment:

(1) Specialized vehicles used to perform aircraft rescue and fire-fighting functions at airports, with particular emphasis on saving lives and reducing injuries coincident with aircraft fires following impact or aircraft ground fires.

(2) Wildland fire apparatus, which includes any apparatus equipped with a slip-on fire-fighting module, designed primarily to support wildland fire suppression operations.

* * * * *

■ 21. Section 1039.805 is amended by adding abbreviations for ''DEF'', ''EEFM'', ''ISO'', and ''SCR'' in alphabetical order to read as follows:

§ 1039.805 What symbols, acronyms, and abbreviations does this part use?

* * * * *

DEF Diesel exhaust fluid.

EEFM Emergency equipment field modification.

* * * * *

ISO International Organization for Standardization (see *www.iso.org*).

* * * * *

SCR Selective catalytic reduction.

* * * * *

[FR Doc. 2012–13088 Filed 6–7–12; 8:45 am]

BILLING CODE 6560–50–P