**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 9 and 86**

**[OAR–2004–0072; AMS–FRL–7922–4]**

**RIN 2060–AM17**

## Control of Emissions of Air Pollution From New Motor Vehicles: In-Use Testing for Heavy-Duty Diesel Engines and Vehicles

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** We are establishing a manufacturer-run, in-use emissions testing program for 2007 and later model year heavy-duty diesel vehicles. The ground-breaking in-use test program will require engine manufacturers to measure exhaust emissions from their diesel engines using portable emissions measurement systems. Also for the first time, all manufacturers will be regularly providing EPA with a significant quantity of emissions data generated from engines used in regular service, which EPA will evaluate to ensure the engines comply with specified emissions requirements. The rule is a result of an agreement between EPA and the Engine Manufacturers Association. This rule advances EPA's clean diesel activities by helping to ensure that the benefits of more stringent emission standards are realized under real-world driving conditions.

**DATES:** This final rule is effective August 15, 2005.

The incorporation by reference of certain publications listed in this regulation is approved by the Director of the Federal Register as of August 15, 2005.

**ADDRESSES:** EPA has established a docket for this action under Docket ID No. OAR–2004–0074. All documents in the docket are listed in the EDOCKET index at http://www.epa.gov/edocket. This rule relies in part on information related to our November 2002 final rule, which can be found in Public Docket A–2000–01. This docket is incorporated by reference into the docket for this action. Although listed in the index, some information is not publicly available, *i.e.*, CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in EDOCKET or in hard copy at the Air Docket in the EPA Docket Center, EPA/DC, EPA West, Room B102, 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:** U.S. EPA, Office of Transportation and Air Quality, Assessment and Standards Division hotline at (734) 214–4636 or *asdinfo@epa.gov.,* or alternatively Carol Connell (734) 214–4349 or *connell.carol@epa.gov*

**SUPPLEMENTARY INFORMATION:**

### Regulated Entities

This action will affect you if you produce or import new heavy-duty diesel engines which are intended for use in highway vehicles such as trucks and buses, or produce or import such highway vehicles, or convert heavy-duty vehicles or heavy-duty engines used in highway vehicles to use alternative fuels.

The following table gives some examples of entities that are likely to be affected by these regulations:

| Category | NAICS codes [a] | SIC codes [b] | Examples of potentially regulated entities |
|---|---|---|---|
| Industry | 336112<br>336120 | 3711 | Engine and Truck Manufacturers. |
| Industry | 811112<br>811198 | 7533<br>7549 | Commercial Importers of Vehicles and Vehicle Components. |

[a] North American Industry Classification System (NAICS).
[b] Standard Industrial Classification (SIC) system code.

This list is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by this action. To determine whether particular activities may be regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the person listed in ''**FOR FURTHER INFORMATION CONTACT**.''

*B. How Can I Get Copies of This Document and Other Related Information?*

1. *Docket.* EPA has established an official public docket for this action under Docket ID No. OAR–2004–0074. The official public docket consists of the documents specifically referenced in this action, any public comments received, and other information related to this action. Although a part of the official docket, the public docket does not include Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Documents in the official public docket are listed in the index list in EPA's electronic public docket and comment system, EDOCKET. Documents may be available either electronically or in hard copy. Electronic documents may be viewed through EDOCKET. Hard copy documents may be viewed at the EPA Docket Center, (EPA/DC) EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. Docket in The EPA Docket Center 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.

This rule relies in part on information related to our November 2002 final rule, which can be found in Public Docket A–2000–01. This docket is incorporated by reference into the docket for this action, OAR–2004–0074.

2. *Electronic Access.* You may access this **Federal Register** document electronically through the EPA Internet under the ''**Federal Register**'' listings at *http://www.epa.gov/fedrgstr/* Or you can go to the federal-wide eRulemaking site at www.regulations.gov.

An electronic version of the public docket is available through EDOCKET. You may use EDOCKET at *http://www.epa.gov/edocket/* to view public comments, access the index listing of the contents of the official public docket, and to access those documents in the public docket that are available electronically. Once in the system, select ''search,'' then key in the appropriate docket identification number.

### Outline of This Preamble

## I. Overview

This section summarizes the manufacturer-run, in-use Not-to-Exceed (NTE) testing program for on-highway, heavy-duty diesel vehicles and engines. It also contains background on the genesis of the rule, an overview of the origin and application of EPA's NTE emission standards, and a brief description of our ongoing in-use NTE. More detailed information on the NTE standards for heavy-duty diesel engines is contained in section II. F. 1. of this preamble.

### *A. Summary of the Rule*

We are establishing a manufacturer-run, in-use NTE testing program for vehicles with heavy-duty diesel engines, beginning in calendar year 2005. The entire program is being adopted largely as we proposed in the **Federal Register** on June 10, 2004 (69 FR 32804) and June 21, 2004 (69 FR 34326). There will be a pilot program in calendar years 2005 and 2006 for gaseous pollutants (*i.e.*, nonmethane hydrocarbons (NMHC), carbon monoxide (CO), and oxides of nitrogen ($NO_X$)). In calendar years 2006 and 2007, there will be a pilot program for particulate matter (PM). Subsequent to these programs, the fully enforceable in-use test program begins. Therefore, the enforceable program starts in 2007 for gaseous pollutants and 2008 for PM. In those years, the test program will apply to 2007 and later model year engines.

This testing program addresses a long standing need to monitor the emissions performance of the engines installed in these on-highway vehicles when they are operated under a wide range of real world conditions. It is specifically intended to monitor compliance with the NTE exhaust emission standards and to help ensure that heavy-duty diesel engines will comply with all applicable emission standards (*e.g.*, including those based on the Federal Test Procedure (FTP)) throughout their useful lives. Background on our NTE standards is presented in sections I. B. and C. of this Preamble.

The new testing program will, for the first time, require engine manufacturers to assess in-use exhaust emissions from heavy-duty diesel vehicles using onboard, portable emission measurement systems during typical operation on the road. Previously, engine emissions testing involved removing the engine from the vehicle and testing the engine in a laboratory on an engine dynamometer. Starting in the mid-1990s, EPA facilitated research into portable systems by developing and using prototype systems on a more limited basis in its compliance programs. Vehicles were instrumented with portable systems to measure their emissions performance during real-world operating conditions. It became clear that these systems offered advantages over conventional approaches to assess in-use exhaust emissions from engines for design improvement, research, modeling, and compliance purposes.

Under the program, we will designate a certain number of heavy-duty diesel engine families for testing. Generally, no more than 25 percent of a manufacturer's engine families would be designated in any single year. We expect manufacturers will use their existing customer relationships and create new lines of communication with customers to recruit appropriate test vehicles from fleets or individual owners. Each selected vehicle will be equipped with a portable emission measurement system and driven by its normal operator, with a normal payload, over its regular driving route. All data and test results will be reported to EPA on a regular basis. The manufacturer of a designated heavy-duty engine family will pay for all of the expenses associated with the planning, vehicle procurement, testing, and data reporting.

The test program is composed of two phases. In the first phase of testing (Phase 1) the manufacturer will test a minimum of five and a maximum of 10 vehicles per engine family selected for testing. If five out of the first five vehicles, or five out of the first six vehicles pass a specified vehicle pass criteria, or vehicle testing criteria, no further testing or other data relating to that diesel engine family will be required from the manufacturer that year. However, we may choose that engine family for testing again in a later year. If the above conditions are not met, then a total of 10 vehicles will be tested in Phase 1. If eight out of the 10 vehicles pass the vehicle testing criteria, no further testing or other data relating to that diesel engine family will be required from the manufacturer for that year.

In all other cases, we will decide on a course of action depending on the number of vehicles from the designated engine family that fail to pass the vehicle testing criteria and other factors. In making our decision, we will thoroughly review the test results, consult with the engine manufacturer, allow the manufacturer to provide additional data, and consider other pertinent information. The action may include, but is not limited to, one of the following:

1. No further action because no significant nonconformance issues are indicated;

2. Initiate the second phase of testing (Phase 2); or

3. Seek some form of remedial action.

If five or fewer of the Phase 1 test vehicles satisfy the vehicle pass criteria, EPA may require the manufacturer to conduct Phase 2 testing. If only six or seven of the Phase 1 test vehicles pass the vehicle pass criteria, EPA may require the manufacturer to conduct Phase 2 testing under these regulations if the manufacturer agrees to perform such testing. However, if Phase 2 testing is conducted for any reason, even if the manufacturer elects to pursue the next phase of testing voluntarily, we may direct that up to 10 additional vehicles be tested. In this phase, we may also focus testing on one or more engine configurations within the engine family. Additionally, we may specify certain driving routes or other driving conditions (*e.g.*, geographic conditions or time of year). The purpose of these additional specifications is to better understand how widespread or under what conditions the Phase 1 test vehicles are failing to pass the vehicle pass criteria. In those instances, the specifications would be based on the Phase 1 test conditions that indicated a potential nonconformity.

As with Phase 1 testing, any remedial action we may choose to pursue based on Phase 2 testing will be made only after a thorough review of the test results, consultation with the engine manufacturer, and consideration of other pertinent information.

The in-use testing program is primarily designed as an information-gathering process that will inform EPA's decision-making. The results of in-use testing for any particular engine family will not necessarily lead to, or necessarily insulate an engine family from, appropriate remedial actions, depending on the particular results of the testing and other information in EPA's possession. However, EPA believes that the results of the in-use testing and information gathered by the program will be a critical resource for EPA in determining how to direct our limited resources.

We expect that the wealth of in-use test data generated by the program will have a number of valuable uses in addition to monitoring heavy-duty diesel engines for NTE compliance purposes under the program. For example, though EPA would not engage in routine NTE testing of engines or engine families that satisfy the Phase 1 test criteria unless new information indicates that a nonconformity exists, we may use the in-use data along with other information to make independent evaluations about the possible need to pursue further testing or actions. We may also use the information in the development of in-use emission factors for emissions and air quality modeling. Further, manufacturers have told us that they expect the proposed program will fortify the traditional laboratory-based engine development process. This will be done by enhancing a manufacturer's ability to evaluate the performance of the engine and emissions control system under real world operating conditions and use, the results of which may be used to create cleaner and more durable future engine designs. Finally, the in-use test data will also be available to the public for review and analysis.

As previously described, the in-use NTE testing program will be fully enforceable beginning in 2007 for gaseous pollutants and 2008 for PM. To ensure a successful launch of this new program, there is a mandatory pilot program for gaseous emissions in calendar years 2005 and 2006, and 2006 and 2007 for PM using only the first phase (Phase 1) of testing. During these years both EPA and the heavy-duty diesel engine manufacturers will gain valuable experience with the in-use testing protocols, and the generation, interpretation, and reporting of in-use emissions data. If an engine family fails to meet the vehicle pass requirements of Phase 1 testing under the pilot program, we will not pursue any form of remedial action based solely on that data. However, we may utilize such information in conjunction with our own test data and other information to assess or pursue any enforcement or remedial action that otherwise may be authorized during that time.

The success of this testing program depends on ensuring that the new onboard, portable measurement systems are correctly measuring exhaust emissions in the field. To this end, we are establishing measurement ''accuracy'' margins for these new systems. The purpose of the margins is to account for the emissions measurement variability associated with these units in the field. During the pilot program years, manufacturers will use interim margins that we believe represent an upper bound of the possible instrumentation variability based on our experience with portable and laboratory measurement systems. Accuracy margins for the fully enforceable program are being developed through a comprehensive research, development, and demonstration program. The program is described in a Memorandum of Agreement and summarized in section II. L. 3. of this preamble.

### *B. Background on the Origins of This Rule*

On October 6, 2000, we published a final rule that promulgated new emission standards for on-highway heavy-duty engines. See 65 FR 59896. The final rule included new standards, applicable to 2007 and later model year heavy-duty diesel engines, called NTE standards. These standards are designed to apply under any conditions reasonably expected to occur during normal vehicle use. The test procedure for the NTE standards is different from most previous test procedures in that it is not based on a rigidly timed test cycle, but instead allows testing at a wide, though bounded, range of engine and ambient conditions that can occur in normal vehicle operations.

These NTE standards, as well as other provisions of the final rule, were particularly designed to ensure that engines and vehicles manufactured to meet the FTP standards over the engine certification test cycle in the laboratory continued to effectively control emissions under any conditions reasonably expected to occur during normal vehicle use. The final rule described our concerns regarding additional factors that may jeopardize the emission reductions expected in-use from the standards promulgated in that rule. See 65 FR at 59910 (October 6, 2000). Among these factors was the absence of an effective in-use compliance program for heavy duty engines and vehicles. We noted that we had received broad support from states, environmental organizations, and industry to move forward with developing a proposal to address this issue. The Engine Manufacturers Association (EMA) committed to work diligently and cooperatively with EPA and the California Air Resources Board (CARB) to resolve the open questions in a timely fashion. See 64 FR 58472, 58514 (October 29, 1999).

EMA and certain individual engine manufacturers challenged EPA's adoption of NTE standards in several rules.[1] EPA, CARB and the engine manufacturers, as well as state and environmental organizations, engaged in lengthy and ultimately productive discussions to settle these challenges and to go forward with a regulatory program that included robust measures to ensure that emission controls implemented to meet EPA and CARB

[1] See *International Truck et al.* v. *EPA,* (DC Cir Nos. 00–1510 and 00–1512); *EMA et al* v. *EPA* (DC Cir. Nos. 01–1129 and 02–1080); *International Truck* v. *EPA,* No. 01–1137; *EMA* v. *EPA,* (DC Cir. No. 00–1066); and *EMA* v. *EPA,* (DC Cir. No. 03–1007)

standards remain effective under all normal vehicle operation. One result of these discussions was the identification of the basic program elements for a manufacturer run, in-use NTE testing program, and an agreement to go forward with a rulemaking to implement such a program for on-highway heavy-duty diesel engines.[2] Today's action essentially completes that rulemaking process.

*C. Historical Context*

1. Genesis and Description of NTE Standards

Traditionally, heavy-duty diesel vehicles and engines have been certified to exhaust emission standards in the laboratory. More specifically, the engine is tested separately from the vehicle using an engine dynamometer and a prescribed ''driving cycle.'' Monitoring for compliance with the applicable emission standards during the life of these vehicles (*i.e.*, in-use) was also determined by removing the engine from the vehicle and then testing it using the same laboratory measurement procedures. Several years ago we became concerned that in-use emissions might inappropriately exceed the applicable standards when engines were operated under conditions not found during traditional laboratory testing (*i.e.*, off-cycle emissions). An investigation into off-cycle emissions performance confirmed that advances in engine technology had allowed some manufacturers to design engines with control strategies which resulted in substantially greater levels of emissions during typical real-world operating conditions than were emitted during the laboratory testing cycle required for certification.

To close the gap between laboratory and real world emissions performance, and to deter manufacturers from using such strategies in the future, we developed NTE emission standards for heavy-duty diesel engines. The NTE requirements establish an area or zone under the torque curve of an engine where emissions must not exceed a specified value for any of the regulated pollutants.[3] The provisions also define a specific range of operating conditions, *i.e.*, temperature, altitude, and humidity. The test itself does not involve a specific driving cycle of any specific length, *i.e.*, mileage or time, rather it involves all driving that could occur within the bounds of the NTE control area. The vehicle (or engine) is operated under conditions that may reasonably be expected to be encountered in normal vehicle operation and use, including operation under steady-state or transient conditions and under varying ambient conditions. Within the NTE control area, emissions must not exceed a specified multiple of the underlying FTP standards. For heavy-duty diesel engines, this multiple is generally 1.25 or 1.50 times the applicable FTP standards.

Initially, the NTE requirements were a key provision in consent decrees with several manufacturers of heavy-duty diesel engines that resulted from the investigation described above. This new requirement became effective in 1998 for most manufacturers involved in those consent decrees, and by November 2002 had been applied for such manufacturers to the $NO_X$ standards set to go into effect in model year 2004. NTE requirements are currently being used as a screening tool for 2004 through 2006 model year engines not covered by the consent decrees. The NTE requirements will be mandatory for all 2007 and later heavy-duty diesel engines. We also promulgated NTE standards for certain other mobile sources.[4]

The NTE test can be conducted in an emissions testing laboratory using an appropriate dynamometer or while the vehicle is being used on the road. It is this last feature that makes NTE testing a very powerful in-use compliance monitoring tool. In-use testing and compliance become much easier with the NTE standards since emissions may be sampled during normal vehicle use on the road using portable emission measurement systems. As already mentioned, traditional laboratory engine testing over a very specific driving schedule requires the engine be removed from the vehicle rendering in-use testing prohibitively cumbersome and expensive. Further, engine-based testing cannot account for the drive train and sensor interactions which occur during normal vehicle operation. As such, testing during normal vehicle use, using an objective numerical standard, makes enforcement easier and provides more certainty of what is occurring in-use versus a fixed laboratory procedure.

2. Current EPA In-Use NTE Testing

We have been conducting our own in-use NTE testing of heavy-duty diesel engines for the past four years. Over that period, an average of 40 on-highway vehicles were tested annually. Vehicles are procured through the voluntary participation of commercial and municipal fleets and emissions are tested during normal service operation. Portable emission measurement systems are installed on-site at the fleet's facility before the vehicle begins its service day. EPA uses a prototype portable sampling system which measures hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen ($NO_X$). Our experience with this program has aided us in developing today's final rule for a manufacturer-run, in-use NTE test program.

3. Plans for Nonroad Diesel Engine In-Use NTE Testing

On June 29, 2004, we published NTE requirements that accompany our new transient-cycle emission standards for nonroad diesel engines (69 FR 38957). This new test cycle will be phased into the certification requirements between 2011 and 2013, depending on an engine's horsepower rating. The NTE provisions are similar to those described in this notice for on-highway heavy-duty diesel engines. Presently, we are developing an outline for a proposed manufacturer-run, in-use NTE test program for nonroad diesel engines covered by the new requirements. We expect this program will have similar characteristics to today's rule, but will address some unique issues pertaining to the nonroad market. Among these are such things as the widely varying power ranges of nonroad engines (including those much smaller and much bigger than highway engines), and broad array of equipment applications that may use the same engine type or model. We expect the program to have a pilot program similar to the pilot program in today's rule and to be initiated consistent with the introduction of emission control requirements for nonroad engines built in conformance with the new standards, which are based on aftertreatment. The resulting implementation date may be as early as 2011.

[2] See Final Settlement Agreement, dated June 2, 2003, in the cases cited above.

[3] Torque is a measure of rotational force. The torque curve for an engine is determined by an engine ''mapping'' procedure specified in the Code of Federal Regulations. A graphical representation of the NTE control area is contained in the Technical Support Document accompanying this proposed rule.

[4] The use of NTE testing as a screening tool for 2004–2006 on-highway heavy-duty diesel engines is discussed in Advisory Circular 24–3. The final rule applying the NTE to 2007 and model year engines is published at 65 FR 59896 (October 6, 2000). Other final rules promulgated by EPA extended the NTE approach to new marine compression-ignition engines at or above 37 horsepower, 64 FR 73300 (December 29, 1999) and 67 FR 68242 (November 8, 2002); and to a new and more stringent phase of on-highway heavy duty engine standards 66 FR 5002 (January 18, 2001).

*D. California's Intent To Adopt an In-Use NTE Test Program*

California's involvement in the development of this program was critical in assuring that engine manufacturers are subject to a consistent national in-use NTE test program. CARB intends to adopt an identical program soon. EPA and CARB expect to coordinate in the annual selection of engine families to be in-use tested and to work together in determining whether Phase 2 testing is warranted for families where the number of passing engines in Phase 1 does not automatically lead to no further testing. CARB has its own authority and decision process in determining remedial action for failing families, but CARB expects to work with EPA and the manufacturers in this process.

**II. Details of the Rule**

This section presents the details of the two-phase in-use NTE testing program for heavy-duty diesel vehicles. It focuses primarily on the fully enforceable program that will begin with the 2007 model year for gaseous pollutants and 2008 for PM. A number of the special features for a pilot program during the two years preceding each of the fully enforceable dates described above are also described. Key aspects of the pilot program are further summarized in section II. M. of this preamble.

We have initiated a comprehensive research, development, and demonstration program that is designed to identify new accuracy measurement margins for portable measurement devices. When completed, the accuracy margins are expected to be adopted for use in the fully enforceable program. EPA has modified the testing requirements during the pilot program for manufacturers that participate in the accuracy margin development effort. In addition, the fully enforceable program for either gaseous emissions or PM may be postponed if the process of identifying the final accuracy margins is significantly delayed beyond the originally scheduled completion dates. The program for developing the measurement accuracy margin is described in section II. L. and the implications of this program are described throughout this preamble as appropriate.

The in-use NTE testing program we are promulgating today is nearly identical to the program we proposed in the **Federal Register** on June 10, 2004 (69 FR 32804) and June 21, 2004 (69 FR 34326). The features of the program that were revised based on public comments received on the proposed rule are described in this section. Our response to the significant public comments is contained in the Summary and Response to Comments document that accompanies this final rule.

*A. Applicability*

The requirements apply to diesel engines certified for use in heavy-duty vehicles (including buses) with gross vehicle weight ratings (GVWR) greater than 8,500 pounds. However, the requirements do not apply to any heavy-duty diesel vehicle that was certified using a chassis dynamometer under our CAP 2000 certification program, including medium-duty passenger vehicles with GVWRs of between 8,500 and 10,000 pounds. The manufacturer of heavy-duty diesel engines subject to the program is responsible for all of the costs associated with project planning, vehicle procurement, testing, and reporting.

We are establishing a fully enforceable, two-phase test program for heavy-duty diesel engines beginning in 2007 for gaseous pollutants and 2008 for PM. In those years, the fully enforceable test program will apply to 2007 and later model year engines. We are also establishing a mandatory pilot program for gaseous pollutants in calendar years 2005 and 2006, and for PM in calendar years 2006 and 2007. Under the gaseous emission pilot program, 2002 through 2006 model year vehicles may be tested. Under the PM pilot program, 2002 through 2007 model year vehicles may be tested. The pilot program will utilize only the first phase of the two-phase program developed subsequent fully enforceable program.

We had originally proposed to require emissions testing for PM concurrently with gaseous emissions. In doing so, we acknowledged that more development work was needed before portable PM-measurement systems were available. However, it appeared possible to complete this work prior to the start of the pilot program in 2005. The engine manufacturers commented that the instrumentation to measure PM emissions onboard a vehicle was not available. Further, they stated that a PM requirement should not be included in the program until such time as validated, properly field-tested onboard devices become commercially available. Our evaluation of the status of portable PM measurement technology shows that the development of portable devices has progressed, but not as quickly as anticipated. We currently expect portable PM measurement systems will be available for 2006. Therefore, we have delayed the start of the PM pilot program one year until that date, *i.e.*, 2006. Similarly, the enforceable program for PM will now start in 2008. A more detailed discussion of both gaseous and PM portable measurement systems is presented in section II. L.

Engine manufacturers commented that the model year applicability for the pilot program was too broad. Specifically, they argued that the plot should be limited to 2005 and 2006 model year vehicles because some 2002 through 2004 engine families were not specifically certified to meet NTE standards. We agree with the manufacturers to the extent that engine families which were not certified in compliance with the NTE requirements should not be tested in the manufacturer-run program. However, their recommended exclusion is also too broad. Instead, we will include model years back through 2002 in the pilot program, but we will only select engines which have been designed to comply with the NTE. This includes engines certified under consent decree requirements, California NTE regulations, and the voluntary NTE provisions contained in EPA guidance document VPCD 98–13 and Advisory Circular 24–3.[5] EPA will only select engine families for which the manufacturer's Statement of Compliance specifically describes the engine as being designed to comply with the NTE either by regulation or voluntarily. For engines not designed to comply with the NTE, EPA does reserve the right to use the NTE as a means to evaluate the appropriateness of a manufacturer's auxiliary emissions control devices (*i.e.*, screen for defeat devices) as explained in the EPA guidance documents above. In such a case, EPA would conduct the testing and would not require the manufacturers to do so under the in-use program.

*B. Engine Family Selection*

1. Number of Engine Families

EPA currently estimates that 71 heavy-duty diesel engine families are being certified by 13 manufacturers that would potentially be eligible for in-use testing under this proposed program. Our goal in deciding how many engine families should be tested each year is to conduct enough testing to assure in-use compliance with the applicable emission standards, while at the same time keep the program from being overly burdensome for the engine manufacturers.

As a general premise, we believe it is a reasonable test all of a manufacturer's

[5] Add titles, etc., for the two documents here.

heavy-duty diesel engine families over a four-year period. So, we will to designate up to 25 percent of a manufacturer's total number of engine families for testing per calendar year. The number of engine families that are tested in a given year will be based on the actual number of engine families certified by that manufacturer in that year, rounded up or down as appropriate. However, for the purpose of calculating the number of engine families certified in a given year, we will only include engine families with a production volume greater than 1,500 engines. This designation strategy will provide in-use test data for most of the diesel engine population and, at the same time, not overburden manufacturers that have several small production engine families. If a manufacturer has three or fewer engine families that exceed the annual 1,500 engine production limit, including when a manufacturer has no families with production levels above that limit, we will only test one engine family per year.

We will also cap the maximum number of families designated for testing over any four-year period to the average number of families for that manufacturer over that four-year period, rounding up or down as appropriate.

Several examples showing how many engine families we can designate each year for testing under the proposed in-use, manufacturer-run program are provided below. The illustrations are arranged in an increasing order of complexity. Additional examples and other relevant information are presented in the Technical Support Document for today's action.

The first two examples illustrate how we would calculate the annual number of engine families for testing using the 25 percent per year limit for engine families above the 1,500 units per year level, and when a manufacturer only has engine families with annual production less than 1,500 units per year. First, Manufacturer A has 12 certified engine families in production in a given model year, and only 8 out of the 12 families have annual productions levels of over 1,500 engines. Then the maximum number of engine families we can designate for in-use testing from Manufacturer A in that calendar year is 2 (*i.e.*, 25 percent of 8 engine families). Second, Manufacturer B has 8 engine families, all with annual production less than 1500 engines. In this situation, we are limited to selecting only 1 engine family for testing in that calendar year.

The next two examples are somewhat more complex. The first of these examples shows how the four-year limitation (*i.e.*, cap) on the maximum number of designated engine families works with a constant number of engine families over time. First, Manufacturer C has 3 engines families in production in each of four consecutive years, or an average of 3 engine families per year over a four-year period. Additionally, all the families have annual production volumes over 1,500 units. In this situation, 1 engine family per year can be designated for testing in three of the four calendar years. However, no family can be selected in one of the four years because the number of families tested would otherwise exceed the average number of families produced over the four-year period. Second, Manufacturer D produces 7 engine families each year during a four-year period and all the families are over 1,500 units per year. In this situation, we can select up to 2 engine families per year under the 25 percent annual limit (*i.e.*, 25 percent of 7 families is 1.75, which rounds up to 2). So, 2 engine families can be designated for testing in three of the four calendar years, but only 1 family can be tested in a fourth year because the four-year cap on the maximum number of engines tested would otherwise be exceeded.

The last example is the most complex. It once again illustrates how the four-year cap on the maximum number of designated engine families applies, but in this case for a scenario were the number of engine families varies over time, and when the fully enforceable program is just beginning (*i.e.*, the 2007 calendar year). Manufacturer E produces 6 engine families in the 2004 through 2009 model years and 7 engine families in the 2010 through 2014 model years. We can order testing for 2 engine families each in 2007, 2008 and 2009 under the 25 percent annual limit (*i.e.*, 25 percent of 6 families is 1.5, which rounds up to 2 using standard rounding practices [6]). In 2010, however we cannot order testing of any families because the average number of certified families in the four years preceding testing (including the current model year) is 6.25, rounded down to 6. Since we have already tested 6 engine families in the previous three years, we cannot test another engine family in the fourth year because the total number of engine families in the four-year period would be greater than the average number of engine families produced in the past four years (*i.e.*, 6). In 2011, we can order the testing of 2 families under the 25 percent annual limit. Here, the average number of engine families in the four years preceding testing (including the current model year) is 6.5. This rounds down to 6, again using standard rounding practices. Since we have only tested 4 engine families in the previous three years, we can test another 2 engine families in the fourth year. For 2012 the average number of engine families in the four-year period is 6.75 (6 families in model year 2009 and 7 families in model years 2010 through 2012). Rounding up from 6.75, we can order testing for 7 engine families in the four-year period prior to 2012. Since we have only ordered testing for 4 families in the previous three years, we can order testing for 2 families under the 25 percent annual limit in 2012. Similarly, we can order the testing of 2 families in 2013. However, in 2014, we can order testing for only 1 engine family because the average number of families produced in the applicable four-year period is 7 and we have already ordered testing for 6 engine families in the previous three years.

Only the most recent and accurate sales information will be used to identify engine families with annual U.S.-directed production volumes of 1,500 engines or less when determining the potential number of engine families we may require a manufacturer to test in any year. When an engine family has reached the end of its production, the actual sales for an engine family that is already required to be submitted to EPA at the end of each model year as part of the certification program will be used for this purpose. If the engine family has not ended production and final sales are not available, then we may use the sales projection that is provided as part of a manufacturer's certification application.

After the number of engine families that are eligible for in-use testing is determined for a calendar year, we may select any engine family for testing that a manufacturer has in production that model year, or any other engine families produced by the manufacturer in previous model years covered by the testing program. We also reserve the right to designate any engine family previously tested under this program in a subsequent calendar year. This will allow us to evaluate the emission performance of heavy-duty diesel vehicles as they accumulate mileage over a number of years. It will also allow us to assess a manufacturer's remedy of any previous

[6] See, ''Guide for the Use of the International System of Units (SI), NIST Special Publication 811, 1995 Edition, National Institute of Standards and Technology, U.S. Department of Commerce.'' Under the rounding convention contained in this reference, when the first digit discarded is exactly 5, the last digit retained should be rounded upward if it is an odd number, but no adjustment made if it is an even number.

nonconformance problem, which was discovered under the proposed in-use testing program. When evaluating past model years for testing, we will also consider such factors as the likely number of vehicles remaining in service and their perspective mileage relative to their certified useful life.

We intend to make our engine family selections by approximately June 30 of each calendar year. Waiting until the mid-point of the calendar year to select engine families for testing increases the likelihood that EPA will be able to choose from a manufacturer's entire product offering for that same model year. Typically, all of a manufacturer's engines for a given model year are covered by a certificate of conformity by the mid-point of that same calendar year. For example, all 2007 model year engines are expected to be certified, in most cases, by June 30, 2007. This also allows EPA to calculate the number of engine families to be ordered for testing in a given calendar year without having to continually update that number and order further testing. In the event one or more engine families are certified by a manufacturer after June 30, we will update our calculation of the number of engine families we can order tested in that calendar year and, if appropriate, order further testing. We still may select any engine family by the end of that calendar year for testing, including the newly certified family, with the understanding that the manufacturer is allowed the same period of time for testing and reporting results from each engine family from the date of selection.

Regarding the testing and reporting period, we are allowing 18 months from the time an engine family is designated for testing until the results must be reported to us. A manufacturer may request up to six additional months to complete and report Phase 2 test results if there is a reasonable basis for needing more time. Further, a manufacturer may request an additional six month extension. More details on the testing and reporting period is presented in section II.K.1.

Engine manufacturers commented that EPA should specify a single point in time for identifying engine families that must be tested for that calendar year's selection since the number of certified families changes over the year. We believe the proposed selection protocol fairly balances our desire to maximize the number of engine families that may be designated for testing in any year, with a manufacturer's need for certainty in its planning process and a manageable testing burden. As already noted, manufacturers normally certify all or most of their engine families by June 30 of each year. So a manufacturer will know either its complete liability under the in-use testing program or the bulk of its responsibility by that time. Because of the lead time normally associated with engine development and the certification process, a manufacturer planning to certify an engine family after approximately June 30 should calculate the possible in-use testing exposure associated with that action and plan accordingly relative to the expenditure of resources. This does not seem overly burdensome, since all selected engine families are provided the same testing and reporting period, regardless of the date the family was selected for testing (see section II.K.1. of this preamble for a discussion of the testing and reporting period). Therefore, we are adopting the engine family selection protocol as proposed.

2. Treatment of Nonconforming Engine Families

If there is clear evidence of an emissions nonconformity with respect to one or more of that manufacturer's families, a manufacturer may be required to test a number of engine families that exceeds the numerical limits described in Section II.B.1. above. More specifically, we may require any engine family for which such a determination is made be tested in the manufacturer-run, in-use NTE testing program in any subsequent year without counting toward the otherwise applicable limit on the number of families we may select in any year.

For the purposes of the in-use testing program only, if an engine family was subject to a recall action (voluntary or mandatory), that failure is clear evidence of a nonconformity for that engine family and any carryover engine family produced in a prior or subsequent model year.[7] [8] The remedied engine family may have been normally selected for testing under the proposed in-use testing program, but did not pass the vehicle pass criteria and was subject to a recall action. Alternatively, the remedied family may have been recalled based on the results of an EPA in-use testing program. This linkage of carryover engine families helps ensure that manufacturers will be sufficiently motivated to remedy in a timely manner any noncompliance which is strongly suspected to cut across multiple engine families. As with other aspects of this program, we will consult with the manufacturer when contemplating a determination of clear evidence. An engine family selected using the ''no count'' designation may have never been tested under the proposed manufacturer-run, in-use NTE testing program, or it may have been tested but no remedial action was initiated based on the test results.

3. Small or Unavailable Engine Families

We recognize the possibility that a manufacturer may find it difficult or impossible to locate a sufficient number of vehicles from a designated diesel engine family to complete testing even after a diligent and good faith recruiting effort. This might especially happen for families with limited sales, or if a significantly older model year is designated for testing. Of course, we will attempt to avoid such an outcome in our engine family selection process. However, if a manufacturer encounters this problem and cannot complete either the Phase 1 or Phase 2 testing in the time frame or manner required, the manufacturer may ask us to modify the testing requirements for such engine family or designate a different diesel engine family for testing.

4. Engine Families Unsuitable for Testing

The Detroit Diesel Corporation (DDC) commented that certain chassis and applications are entirely unsuited for in-use testing, and that these should be excluded from the program. As an example, the company identified fire truck and emergency vehicles with unique engine families as falling into this category because they can not be instrumented without compromising the utility of the chassis. Also, DDC suggested that there are numerous applications where interior space constrains would not allow mounting the test equipment inside the cab and still provide for the presence of a technician. In this latter regard, the company noted that weatherproof systems are yet to be developed by instrument manufacturers. Consequently, DDC recommended that EPA not require in-use testing of engine

[7] Manufacturers designate carryover engine families during the certification process. The carryover designation indicates that the engine family for which a certificate is being requested is nearly identical to an engine family which has been previously certified. In such instances, the emissions results from the previously certified engine family are directly applied or carried over to the engine family for which a certificate is being requested.

[8] Section 207 (c) of the Clean Air Act (CAA) authorizes EPA to require manufacturers to recall vehicles or engines for the purpose of remedying noncompliance with EPA regulations that occur during the regulatory useful life of the vehicle or engine. EPA may only require a recall when the noncompliance involves a substantial number of a class or category of vehicles or engines which have been properly maintained and used. (See CAA Section 207(c)). The procedures EPA uses to administer emissions recalls are described in 40 CFR Part 85 Subpart S.

families constrained by such application considerations.

In general, EPA will avoid selecting engine families, and vehicle chassis and applications where testing with portable emissions sampling systems is infeasible, impractical, or unsafe. We anticipate that such testing challenges would generally be isolated to a specific sub-class of vehicle chassis or applications. Therefore, engine families are not expected to be wholly eliminated from consideration for reasons of portable testing incompatibility. To the extent incompatible engine families exist, they will likely be characterized by small volume annual production of fewer than 1,500 units. In general, these low production engine families will be selected for testing less frequently than their larger volume counterparts which makes it easier to avoid compatibility issues.

We also believe that the in-use testing requirements provide manufacturers sufficient latitude to avoid selecting vehicles which are not suitable for in-use testing. In our own in-use testing with portable emission measurement devices, we have successfully tested both fire trucks and emergency vehicles. Additionally, the final regulations allow a manufacturer to reject a particular vehicle from the program if it is found to be unsuitable without prior notification to EPA. Any rejected vehicle must be replaced with another perspective test vehicle, and the rejection reported to us in the manufacturer's normal in-use testing reports. We will provide additional guidance on the conditions that must be satisfied to reject a vehicle for this purpose.

We expect that concerns about the suitability of portable testing will continue to diminish as portable emissions measurement systems evolve into more compact, durable, user-friendly devices.

*C. Phase 1 Testing Scheme*

1. Focus of Initial Testing

The first phase of testing, Phase 1, is intended to quickly screen a designated heavy-duty diesel engine family for conformity with the applicable NTE standards. If enough of the engines tested from the family pass the initial screening, no additional testing of that family is required under the in-use testing program in that year. If the early test results from Phase 1 indicate a potential nonconformity, then several more vehicles must be tested to generate additional information regarding the significance of any potential problem, or whether more testing in the next phase of the program, Phase 2, is needed to further evaluate the emissions performance of that engine family.

2. Engine Family Evaluation Criteria and Outcomes

For Phase 1 testing, a manufacturer must test a minimum of five and a maximum of 10 different vehicles within a designated engine family. The exact number of vehicles depends on how many of the tests exceed a specified numerical emissions limit, or the vehicle pass criteria, not to be confused with the proper maintenance and use criteria (see section II. E. of this preamble for a description of the vehicle pass criteria). Requiring up to 10 vehicle tests will provide sufficient information for us to decide if further testing or other information is needed to better evaluate a potential nonconformity, or if some form of remedial action may be warranted. This level of testing will provide a quick indication of an engine family's emissions compliance without being overly burdensome to engine manufacturers. Our multi-step engine family evaluation criteria and the outcomes associated with how many vehicles pass the in-use testing requirements at various levels within the testing hierarchy are described below.

A manufacturer will initiate Phase 1 by testing 5 vehicles. If all five satisfy the vehicle pass criteria (*i.e.*, 5 out of 5 pass), testing stops and no other action is required of the manufacturer for that diesel engine family under the program for that year. If only one of the initial test vehicles fails the vehicle pass criteria, the manufacturer will test another vehicle. The manufacturer may stop testing if the sixth vehicle satisfies the vehicle pass criteria (*i.e.*, 5 out of 6 pass). In the event that neither of the above conditions are met (*i.e.*, 4 or fewer out of 6 pass), the manufacturer must test a total of 10 vehicles.

Various outcomes are possible based on the observed number of vehicle passes or failures from the Phase 1 testing, as well as other supplemental information. If all four of the additional test vehicles met the vehicle pass criteria and only two of the original six test vehicles exceeded the criteria (*i.e.*, 8 out of 10 pass), testing stops and no other action is required of the manufacturer for that diesel engine family under the program for that year. When six or seven of the 10 test vehicles satisfy the vehicle pass criteria (*i.e.*, 6 or 7 out of 10 pass), the manufacturer must join EPA in follow-up discussions to determine whether any further testing, investigations, data submissions, or other actions may be warranted. In such a case, three outcomes are possible. First, we may ultimately decide not to take further action if no significant nonconformity is indicated after a thorough evaluation of the causes or conditions that caused vehicles in the engine family to fail the vehicle pass criteria, and a review of any other supplemental information obtained separately by EPA or submitted by the manufacturer shows that no significant nonconformity exists. Testing would then stop and no other action is required of the manufacturer for that diesel engine family under the program for that year. Second, we may seek some form of remedial action from the manufacturer based on our evaluation of the Phase 1 test results and review of other supplemental information. Third, and finally, the engine manufacturer may undertake Phase 2 testing, if both EPA and the manufacturer agree this is the best course of action. Of course, a manufacturer may always voluntarily conduct Phase 2 testing.

In the event that fewer than six test vehicles comply with the vehicle pass criteria (*i.e.*, 5 or fewer out of 10 pass), the manufacturer must consult with us just as when six or seven out of 10 pass as described above. Once again, we may decide not to take further action if no significant nonconformity is indicated. If a possible nonconformity is indicated, the consultation may lead us to mandate Phase 2 testing even if the manufacturer does not voluntarily elect to do so. In situations where a significant nonconformity is observed during Phase 1 testing, we may order a recall action for the diesel engine family in question if the manufacturer does not voluntarily initiate an acceptable remedial action.

*D. Phase 2 Testing Scheme*

1. Initiation and Focus of Additional Testing

The primary purpose of Phase 2 test program is to gain further information regarding the extent to which, and under what conditions, the vehicles from the designated engine family are failing to pass the vehicle pass criteria. If appropriate, a manufacturer's testing may be focused on certain test conditions or a subclass of engines within the designated heavy-duty diesel engine family as outlined below. As described previously, EPA and the manufacturer may agree that it is appropriate to initiate Phase 2 testing if six or seven of the 10 test vehicles in Phase 1 satisfy the vehicle pass criteria. Phase 2 testing may also be mandated by us in the event that only five or fewer of the test vehicles in Phase 1 meet the

vehicle pass criteria. (See section II. C. for additional information regarding the conditions under which Phase 2 may be initiated.)

2. Number of Engines and Test Conditions

We may require a manufacturer to test up to 10 vehicles from the designated heavy-duty diesel engine family under Phase 2. We may, at our discretion, require the testing of fewer than 10 vehicles. A pass/fail determination for each vehicle will be made by comparing its measured emissions to the same vehicle pass criteria used in Phase 1. Testing up to 10 additional vehicles under this phase of the program will provide valuable information regarding whether the engine family conforms with the applicable requirements.

We may direct a manufacturer to test one or more specific engine and emission control or power configurations (*i.e.*, subclasses) within the designated engine family. Additionally, we may specify certain driving routes or other driving conditions (*e.g.*, temperatures, altitudes, geographic conditions, or time of year). As already discussed, the purpose of these additional specifications is to better understand the extent to which, and under what conditions, the vehicles in the engines family are failing to pass the vehicle pass criteria. Therefore, the specifications would be based on the Phase 1 test conditions that indicated a potential nonconformity.

We requested comment on whether EPA should similarly be allowed to direct a manufacturer to test specific engine configurations, test routes, and driving conditions for Phase 1 testing. We are not adopting that requirement based on our review of adverse comments we received from engine manufacturers. The comment and our response is contained in section II. J. of this preamble.

*E. Vehicle Pass Criteria*

Generally, the vehicle pass criteria require measuring the emissions from the test engine each time it operates for 30 seconds or more in the NTE control area. The NTE control area is a defined range of engine operating conditions that are subject to the NTE emission standards (see section I. C. 1. of this preamble for more information on the NTE control area). Each excursion into the NTE control area for thirty or more seconds is called an NTE sampling event. The 30 second minimum is intended to moderate the influence of short-duration, high intensity emission spikes that do not have a significant bearing on overall, real-world emissions in the compliance determination. The average emission level of the NTE sampling event for each regulated pollutant is then compared to its corresponding NTE emission threshold. The NTE emission threshold is the sum of the applicable NTE standard, any in-use compliance margin already allowed by the regulations, and the new in-use measurement margin allowance. The vehicle pass criteria then require a comparison of the number of NTE sampling events for an individual pollutant that were below the respective NTE threshold to all of the sampling events from the test for that same pollutant. The NTE threshold is further described in section II. F. of this preamble. Also, for the first three years of the program, no sampling event may be higher than a specific maximum emission limit. The maximum emission limit for these engine families is described below.

More specifically, all valid NTE sampling events for a pollutant must be used in the vehicle pass determination. A valid NTE event is any sample that meets the 30 second minimum period described above, excluding any engine operation that is exempt from the NTE standards under the existing regulations. NTE carve-out provisions may either exclude certain operating points from the NTE engine control area or exempt engines from the NTE standards when operating in defined regions of the NTE engine control area. Currently, an engine may also be allowed to temporarily exceed the NTE standards under certain limited circumstances under the NTE deficiency provisions.[9] If 90 percent of the valid NTE samples on a time-weighted basis for a regulated pollutant are no greater than the applicable NTE threshold, then the test engine meets the vehicle pass criteria for that particular pollutant.

However, model year 2007 through 2009 engines must meet certain additional requirements. For these years, 100 percent of the valid NTE samples for any regulated pollutant must also be less than two times (2X) the applicable NTE threshold, except when the engine is certified to a Family Emission Limit (FEL) for $NO_X$ of 0.50 gram per brake horsepower-hour (g/bhp-hr) or less. In this case, 100 percent of the valid NTE $NO_X$ samples must be less than two times the NTE threshold or less than 2.00 g/bhp-hr, whichever is numerically greater. While operation in the area of an approved deficiency or carve-out is excluded from being a valid NTE event for the purposes of this in-use testing program, manufacturers must still employ appropriate emissions control during operation in these regions as required by the prohibition against defeat devices. For any operation which occurs within the area of an approved NTE deficiency, we will compare the measured emissions results to the emissions estimates the manufacturer provided for that deficiency at the time of certification so we can determine whether the deficiency requirements have been met.

The 90 percent criterion should provide a good indicator of compliance with the applicable emission standard, while at the same time allowing for certain emissions behavior that may be very infrequent or unusual in nature and, therefore, atypical of overall in-use operation. We have fashioned the additional maximum NTE criteria for 2007–2009 model year engines because we believe it appropriately reflects the capability of current control technology when robustly designed and properly maintained. We do not envision any situation where the current technology could not be designed to avoid emissions above these maximum criteria, even in the atypical situations mentioned above. EPA will evaluate the need for, and level of, any such NTE maximum criteria for 2010 and later model year heavy-duty diesel vehicles based, in part, on data from the proposed in-use test program, the capability of technology used to comply with the 2010 model year requirements, and other relevant test information. If we decide that such criteria are appropriate based on this review, any new requirements will be established in a rulemaking action. If we take no action, the maximum NTE criteria will cease to exist after the 2009 model year.

We are adopting the following multi-part methodology for determining if the engine complies with the 90 percent vehicle pass criterion for each regulated pollutant. First, find the average g/bhp-hr emission level for each valid NTE sample for a specific pollutant by dividing the total mass of measured emissions (*e.g.*, grams) by the amount of work performed during the NTE event (*e.g.*, brake horsepower-hour). (Note that this step is also used to determine compliance with the maximum NTE criteria for 2007–2009 model year engines as described above.) Second, determine for each valid NTE sampling event, whether the average emission level is less than or equal to the NTE threshold for that same pollutant. Third, calculate a time-weighted vehicle pass ratio for the pollutant, or the number of valid NTE sampling events that meet the

[9] For more information on NTE control area limits and exclusions, see 65 FR 59912, 59914 (October 6, 2000), and 66 FR 5040 (January 18, 2001).

applicable NTE threshold compared to the total number of valid NTE sampling events, weighted by the time of each valid NTE event. To do this, begin by summing the time from each valid NTE sampling event where the average emission level for each pollutant is no greater than the NTE threshold for that pollutant, and then divide this value by the sum of the engine operating time from all valid NTE samples. The resulting value is the vehicle pass ratio for that pollutant and test. However, if any single valid NTE sampling event exceeds 600 seconds or 10 times the length of the shortest valid NTE event, the time contribution for that event must be limited to the smaller of 600 seconds or 10 times the shortest event for the above calculation. These conditions on the maximum allowable duration for any single NTE event are intended to prevent a small number of very long sampling events from inappropriately overwhelming the time-weighted results.

A vehicle must meet the vehicle pass criteria for every individual pollutant in order for the vehicle to ''pass'' the test under the terms of the in-use testing program. Stated differently, failing the vehicle pass criteria, even for a single pollutant, counts as a vehicle failure for that particular test.

We want to clarify that the vehicle pass criteria used for the manufacturer-run, in-use testing program do not correspond specifically to the criteria for showing compliance to the NTE standards. That is, the fact that a vehicle meets the vehicle pass criteria under this program does not mean that the vehicle passes the NTE standards, or that the engine family is in full compliance with the standards, and the use of these criteria to show a vehicle ''pass'' in this program does not indicate that the criteria would be appropriate for NTE testing in other contexts.

The vehicle pass criteria, along with the engine family evaluation criteria of the Phase 1 and Phase 2 test schemes (described later), are designed to help make the best use of manufacturers' and EPA's resources in determining what further action is appropriate regarding that engine family. Therefore, the vehicle pass criteria, the definition of a valid NTE sampling event, the criteria for moving from Phase 1 to Phase 2, and all others aspects of the in-use testing program are solely for purposes of this manufacturer run, in-use test program and are not intended to revise, change, or interpret the NTE standards, the NTE test procedures, or to define compliance with the standards.

*F. NTE Threshold Specification*

The numerical value of the NTE threshold is defined as the applicable NTE standard, including any compliance margin already built into the standard for in-use testing, in addition to a new margin to account for the in-use measurement accuracy of the portable emission measurement systems. Therefore, these margins are added to the applicable standard or FEL to determine the numerical in-use compliance limit (*i.e.*, NTE threshold).

1. Not-to-Exceed Standards

NTE standards applicable to model year 2007 and later heavy-duty diesel engines apply to the exhaust emissions of non-methane hydrocarbons (NMHC), carbon monoxide (CO), particulate matter (PM) and oxides of nitrogen ($NO_X$) from these engines. The levels of the NTE standards for these pollutants are determined by applying a multiplier to the applicable FTP standard. The multiplier varies by pollutant and certification level, but it is generally either 1.25 times the FTP standard or 1.50 times the FTP standard. See 40 CFR 86.007–11(a)(4). For 2002–2006 model year engines tested under the pilot program, the applicable NTE limit used to develop the NTE threshold is 1.25 the FTP standard for that model year.

The FTP standards for 2002 and 2003 model year heavy-duty diesel engines are contained in 40 CFR 86.099–11, except that those engine families subject to NTE requirements under the Consent Decrees would use an NTE threshold based on the FTP levels found in the appropriate Consent Decree. The standards for 2004 to 2006 model year heavy-duty diesel engines are contained in 40 CFR 86.004–11. Those for 2007 and later model years are shown in 40 CFR 86.007–11.

2. Existing In-Use Compliance Margins

We previously established compliance margins for in-use $NO_X$ and PM emissions testing of 2007 to 2010 model year heavy-duty diesel engines. For $NO_X$, the margin varies by mileage from 0.10 to 0.20 g/bhp-hr for engines certified to an FEL no higher than 1.3 g/bhp-hr. For PM, the margin is 0.01 g/bhp-hr. (See 40 CFR 86.007–11(h) for more details.)

3. New Measurement Margins for Portable Measurement Systems.

We are including new ''accuracy margins'' in the calculation of the emission thresholds for this program. The allowances are primarily designed to account for any differences between the accuracy of the portable emission measurement instruments for use on a vehicle and the accuracy of those available for use in a laboratory. The allowance also takes into account the different way in which emissions are calculated in a laboratory versus in the field. Because of the continuing uncertainty regarding the specific accuracy of development for portable measurement systems (See section II. L.), we have chosen to adopt an interim set of accuracy margins at this time. These margins will be used only in the pilot program. As explained below, we are developing more precise accuracy margins for use in the subsequent fully enforceable in-use testing program.

a. *Pilot Program Accuracy Margins.* During the pilot program years that precede the fully enforceable program, manufacturers will use interim margins that we believe represent an upper bound of the possible instrumentation variability based on our experience with portable and laboratory measurement systems. The pilot program accuracy margins are: NMHC, 0.17 grams per brake horsepower-hour (g/bhp-hr); CO, 0.60 g/bhp-hr; $NO_X$, 0.5 g/bhp-hr; and PM, 0.10 g/bhp-hr.

b. *Final Program Accuracy Margins.* The margins for the fully enforceable program, *i.e.*, 2007 for gaseous pollutants and 2008 for PM, are being jointly developed through a comprehensive research, development, and demonstration program. The cooperative program is described in a Memorandum of Agreement (MOA) among EPA, CARB, and the engine manufacturers.[10] The purpose of the MOA is to specify: (1) A detailed roadmap for developing data-driven margins based on a sound engine and vehicle test plans; (2) the respective roles and responsibilities of each party; (3) the exact statistically-based algorithms for calculating the data-driven margins; (4) how the final margins can be incorporated into the in-use testing regulations; and (5) the consequences of failing to complete the cooperative program in time to start either the gaseous or PM fully enforceable testing program as adopted in today's action. See section II. N. of this preamble for a more complete description of the MOA.

As described at the beginning of this section, we chose the additive approach for incorporating the new portable measurement system accuracy margins into the NTE thresholds. We did this to

[10] See ''Memorandum of Agreement, Program to Develop Emission Measurement Accuracy Margins for Heavy-Duty In-Use Testing,'' dated May XX, 2005. A copy of the memorandum is contained in the public docket for this rule and at the EPA/OTAQ Web site (*http://www.epa.gov/otaq/hd-hwy.htm).*

encourage instrument manufacturers to develop more accurate and repeatable portable measurement instruments in the future. A fixed allowance creates the same situation that already exists for laboratory measurement instruments, which encourages more accurate and repeatable instruments. That is, with no allowance or a fixed allowance, a more accurate and repeatable instrument will allow engine manufacturers to allocate a smaller fraction of their compliance margin to instrument error. We will revisit this issue in the future to determine if the final margins determined through the comprehensive program discussed above should be reduced or eliminated based on technical advances in these devices. To this end, we intend to adjust or phase-out such a margin through future rulemaking based upon improvements to the measurement equipment. We intend, however, that no future action to revise the final margins discussed above would take effect prior to 2010. The adjustment or phase-out would apply to any engine tested after such a rule became effective.

*G. Considerations in Deciding on Remedial Action*

In determining whether to pursue some sort of remedial action following Phase 1 and Phase 2 testing, we will consider supplemental information obtained separately by us, or submitted by the engine manufacturer. This information could include emissions data from additional tests performed with onboard portable emissions measurement devices, as well as from testing conducted using engine dynamometers or chassis dynamometers. The information may include an evaluation of, among other things: The margin by which any exceedence was above the NTE threshold; the number of engines that showed exceedences; the frequency and duration of any exceedences as compared with the aggregate amount of time that all of the test vehicles were operated within the NTE zone; the emissions of the test vehicles over the entire test route, including average(s); the projected emissions impact of the exceedences; and the relationship of the exceedences at issue to the engine family's ability to comply with the applicable standards or FELs. We will also consider any other data or factors relevant to determining whether to pursue some form of remedial action.

*H. Quantity of Data Collected*

The minimum time for data collection from a test vehicle is one full shift (work) day of operation, provided that each test vehicle operates in non-idle modes for at least 3 hours during a typical shift day. Prior to the commencement of either Phase 1 or Phase 2 in-use testing, the manufacturer will screen-out from Phase 1 testing any vehicle that the manufacturer reasonably determines is unlikely to operate in non-idle modes for at least 3 hours over a full shift.

In the event that a selected test vehicle does not operate in non-idle modes for at least 3 hours over the full shift day, we are requiring that the vehicle must be tested over a second full shift day of operation. Testing shall not be required beyond the second full shift day even if that second day of testing also fails to yield, in the aggregate, 3 hours of vehicle operation in non-idle modes. After the second day of testing, the valid NTE sampling events will be evaluated according to the previously outlined criteria, even if less than 3 hours of non-idle data is collected. In the event that no valid NTE sampling events are recorded from a selected test vehicle, that vehicle will be deemed to have satisfied the vehicle pass/fail criteria for the purposes of this in-use testing program. At their option, manufacturers may conduct in-use testing for a longer duration.

While the minimum data collection requirement described above applies to both the pilot and fully enforceable programs, an evaluation of in-use test data prior to 2007 could change the final value for the data collection period. During the pilot program, we will perform a statistical analysis, in collaboration with EMA, of the available in-use testing data, particularly the data generated under the proposed pilot program described below, to determine the necessary parameters of the test regime. The end result could be either a longer or a shorter period of data collection, or other revisions to the in-use NTE testing program. We will, if appropriate, amend the regulations based on the outcome of this analysis.

*I. Screening, Adjustment, and Mileage of Test Vehicles*

To help ensure that testing is conducted on a diverse sample of ''qualified'' vehicles, our proposal identified a number of general pre-selection criteria for prospective test vehicles within a designated engine family. First, test vehicles must be obtained from at least two sources. We envision the most common source of engine will be fleet operators, but could also include independent operators. As stated previously, we believe manufacturers will be able to leverage existing relationships with its customers or use this program as an opportunity to strengthen those relationships. Second, manufacturers must screen each selected vehicle for proper use and maintenance and reject those vehicles which have not been properly maintained and used. Third, prospective test vehicles must be screened to identify those that are reasonably likely to operate in non-idle modes for at least 3 hours over the course of a full shift day (see section II. H. of this preamble for more on the non-idle and shift day requirements). Fourth, engines or critical vehicle systems that have been tampered with, rebuilt, or subjected to major repairs that could affect emissions, will not be used in testing. Fifth, test engines must have their adjustable parameters set to the specifications contained in the vehicle/engine maintenance manual (*i.e.*, set to spec). Sixth, manufacturers must establish appropriate means to ensure that test vehicles are operated only on diesel fuels meeting the requisite specifications for the model year in which they were emissions certified. Seventh, and finally, no prospective test vehicles may be rejected because of high mileage, except for those whose engines that exceed their regulatory useful life.

We proposed that each manufacturer submit a general plan describing how they would identify, locate, and screen vehicle for in-use testing. The general plan was intended to cover all engine families selected for testing by EPA. The plan was to indicate whether the procurement and screening method may result in an emphasis on testing engines from a particular type of driving route or from a particular geographic area. The plan needed to identify the business relationships, such as with vehicle manufacturers or fleet operators, that would be used to recruit vehicles. The plan was to describe the methods that will be used to gather available information about whether vehicles and engines meet the seven general vehicle criteria described above, including any forms or procedures that will be used. Finally, the plan would cover situations not specifically addressed by the above seven cases. For example, how the presence of an onboard diagnostic (OBD) system trouble code or an illuminated malfunction indicator lamp (MIL) would be treated in the test program. Deviations from the general plan would need to be submitted to EPA for evaluation.

The engine manufacturers commented adversely on the mandatory nature of the general plan. They stated that the general plan requirements would unacceptably increase the burden of the overall test program by adding multiple

layers of costs, delays, and complexities. Further, they claimed that the requirement is not consistent with the ''screening'' nature of the Phase 1 testing as described in the settlement agreement. Manufacturers suggested that a more reasonable approach for dealing with this issue, as described in the preamble for the proposal, is for EPA and the engine manufacturers to work together to develop appropriately detailed guidance documents relating to recruitment, screening, and preparation of vehicles for testing. They also commented that if the general plan requirements were retained, EPA should specify its review time for plan approval.

We agree that it will likely be more efficient to obtain the information contained in the general plan through guidance rather than specific requirements in the regulations. We are currently developing the guidance with help from CARB and the engine manufacturers. The proposed general plan criteria, as well as other items, are included in the guidance. It also includes a template for manufacturers to submit the information suggested in the general plan. The manufacturers will not be required by the guidance to provide a general plan but if they do so, we would expect the criteria in the guidance to be followed.

We continue to feel that the information contained in the voluntarily submitted general plan will be valuable to us in proving a greater understanding of how the manufacturers conduct their testing programs and an increased confidence in the test results. Without this information, we will feel compelled to perform an increased level of our own in-use testing to validate the manufacturer's test results. We have reduced the potential burden associated with the voluntary submittal by making the plan sufficiently general to cover multiple engine families. We now envision an annual or maybe even a one-time submission of the general plan with manufacturers only highlighting deviations from the plan for a given engine family. The aforementioned template will accommodate a discussion of any deviations.

In response to comments, we have also identified protocols regarding the use of appropriate diesel fuels or biodiesel fuel blends in test vehicles and addressing vehicles with onboard diagnostic system (OBD) trouble codes or illuminated malfunction indicator lamps (MIL).

For test fuels, we proposed that manufacturers must establish appropriate means to ensure that test vehicles are operated only on diesel fuels meeting the requisite specifications for the model year in which they were emissions certified. Engine manufacturers commented that EPA should provide a mechanism or approach to ensure no vehicle failures were due to bad fuel. Specifically, they requested that a real pre-testing method of ensuring that a vehicle has been operated only on proper diesel fuels must be developed and integrated into the in-use testing program to avoid improper and wasteful testing. The manufacturers also commented that the proposed provision would require testing to be performed using fuel meeting the specifications for certification fuel. Requirements to find and ensure the use of such fuel will be overly burdensome. Finally, they recommended that the test fuel provision be modified to specify that diesel fuel consistent with the engine manufacturer's recommendations be used for testing. This was a special concern related to the use of certain biodiesel fuel blends.

From the comments it is clear that engine manufacturers and EPA share the same goals regarding the use of test fuels that are appropriate for in-use testing, *e.g.*, they are representative of commercially available in-use fuels and a reasonable method be identified to avoid wasteful testing on inappropriate fuels. After further discussions with CARB and engine manufacturers on this issue, we are adopting the following approach.

A prospective test vehicle's fuel tank(s) may be drained and refilled with fuel conforming to the ASTM D975 specifications prior to conducting any test. Manufacturers may not provide special fuel for in-use emissions testing. If fuel is needed before initiating or during an in-use test, it must be procured from a local retail establishment near the site of vehicle procurement or screening, or along the test route. Alternatively, the fuel may be drawn from a central fueling source provided that the fuel used is representative of that which is commercially available in the area where the vehicle is operated. If the manufacturer can document that owner/operator of the prospective test vehicle has an established pattern of using one or more specific fuel additives and the fuel treatment is not prohibited in the vehicle's owner or operator manual, the manufacturer may continue to add that same fuel treatment for in-use testing. Also, the engine manufacturer may take pre-test and post-test fuel samples from recruited vehicles to ensure that appropriate fuel was used during in-use emissions testing. All fuel test results must be reported to EPA.

Engine manufacturers have indicated a special concern with the use of biodiesel fuel blends in prospective test vehicles. We want to make it clear that the past use of biodiesel fuels is not grounds for automatically rejecting the vehicle from the test program. Biodiesel-fueled vehicles are acceptable if they use any biodiesel fuel blend (*e.g.*, biodiesel blends not in excess of B5) that is either expressly allowed or not otherwise indicated as an unacceptable fuel in the vehicle's owner or operator manual. A vehicle recruited into the program with a biodiesel fuel blend that is either expressly allowed or not otherwise indicated as an unacceptable fuel in the vehicle's owner or operator manual, may not be rejected from testing. Of course, vehicles using biodiesel fuel blends may have their fuel tank(s) drained and refilled with ASTM D975 compliant fuel or an acceptable biodiesel fuel prior to testing. The use of fuel additives is also allowed as described above.

Finally, if a test vehicle fails the vehicle pass criteria and the manufacturer can prove that a non-compliant ASTM diesel fuel or prohibited biodiesel fuel blend was used at any time during the in-use emissions test, that particular test may be voided. In this case, the vehicle will be treated as described above.

Turning to the OBD trouble codes and MILs, we proposed to prohibit manufacturers, as a general rule, from excluding vehicles from in-use testing if the vehicle had an OBD trouble code or MIL illuminated. Further, we proposed that manufacturers could not, as a general matter, remedy the cause of the trouble code or MIL illumination prior to or during in-use testing. However, the existence of these codes or lights during the screening process may indicate that the vehicle has been poorly maintained, tampered with, or improperly fueled. In these cases the manufacturer could request that the vehicle be rejected from the program. If a trouble code is set or malfunction light was displayed after the vehicle has been accepted into the program, this also would not be automatic grounds for eliminating a vehicle or aborting a test once it has begun. Here the manufacturer could either test the vehicle with the code or ask for approval to remedy the cause of the code if it is maintenance related. We provided a number of examples illustrating specific occurrences of OBD codes or MILs and the likely disposition of those vehicles relative to the testing requirements.

The engine manufacturers commented that testing with MILs or codes represents abnormal operation because owners of heavy-duty vehicles attend to these problems promptly in order to protect their business operations. Hence, they argued, that it does not make sense to require testing of vehicles with these conditions unremedied and it is inconsistent with the settlement document that calls for testing vehicles during their ''normal operations.'' The manufacturers also stated that there is no comprehensive OBD program aimed at flagging emission exceedences or specific flaws in an engine's emission control system. Therefore, they believed it is unfair to presume that an activated MIL or trouble code necessarily would signify an emissions-related issue. Finally, manufacturers claimed that having to ask EPA for permission to reject or repair a vehicle would cause delays in conducting the program and be unnecessarily expensive.

Although there is currently no federal OBD requirement for heavy-duty diesel engines, EPA is in the early stages of developing such a requirement. The heavy-duty in-use testing program needs to be designed to accommodate the expected future OBD regulations. Further, manufacturers currently use diagnostic routines systems to varying degrees to assist service technicians in the repair of today's engines. To the extent those diagnostic routines identify potential problems with the emissions control system, it is appropriate for that information to be considered in the in-use test program, even if the OBD system is not designed to flag emission exceedences. At a minimum, even today's OBD systems can potentially identify flaws in an engine's emission control system that could cause an emissions exceedence. We continue to believe that OBD information can potentially be valuable in identifying potential in-use emissions exceedences and understanding their cause.

As in the proposal, EPA will require manufacturers to supply known OBD information both with regard to the history of the vehicles and their performance once accepted in to the manufacturer-run in-use testing program. This information is important in that it may indicate emissions-related problems relevant to whether the engines have been properly designed to meet emission standards for the useful life of the engine and whether the engines are in fact meeting such standards during the useful life of the engine.

However, EPA agrees with the comment that owners of heavy-duty vehicles are instructed and are likely to attend to OBD related problems promptly. Therefore, manufacturers will not be required to test vehicles with a MIL illuminated or a trouble code set. We believe it is more appropriate to review emissions-related concerns identified by the OBD system without requiring manufacturers to use such vehicles in the in-use testing program, and the information that we receive from manufacturers will aid in this review. At their discretion, a manufacturer may generally test the vehicle with the MIL illuminated or trouble code stored, repair the vehicle and then test it (without EPA approval), or reject the vehicle from the test program as follows:

1. If a vehicle is received into the program and the length of MIL illumination or trouble code storage is consistent with proper maintenance and use, then the vehicle must be tested as received or repaired prior to testing. If the vehicle is repaired, the manufacturer must report the repair and the associated MIL illumination or trouble code to EPA;

2. If the vehicle is received into the program and the length of MIL illumination or trouble code storage is inconsistent with proper maintenance and use, the manufacturer has three options. First, test the vehicle as received. Second, repair the vehicle prior to testing and report the repair and associated MIL illumination or trouble code to EPA. Third, reject the vehicle from the test program and replace it with another vehicle. The manufacturer must report the repaired or rejected vehicle and its associated MIL illumination or trouble code to EPA; and

3. If a MIL goes on or a trouble code is set during an in-use test, the manufacturer has two options. First, stop the test, repair the vehicle, and re-start the testing. In this case, only the portion of the full test results without the MIL illuminated or trouble code set would be used in the vehicle pass determination. Second, stop the test, repair the vehicle, and initiate a new test. In this case, only the post-repair test results would be used in the vehicle pass determination. Again, any repair, and the associated MIL illumination or trouble code must still be reported to EPA.

We intend to have developed a guidance that addresses a number of issues pertaining to vehicle recruitment, screening, maintenance, and testing. The document will also provide guidance in identifying the activity thresholds for OBD trouble codes and MIL illumination referred to above.

We also received several additional comments related to vehicle acceptance, vehicle selection, screening, and maintenance. First, we proposed to require that a manufacturer notify us prior to rejecting a prospective vehicle from the program for reasons other than failing to meet acceptance criteria contained in the general plan. The engine manufacturers commented that they should not be required to notify EPA that a candidate vehicle has been rejected if the owner decides not to make the vehicle available for testing. We agree that our proposal to require advanced notification in this instance could be burdensome. We have amended the regulations to clarify that no notification is required prior to rejecting a vehicle if the owner refuses to participate in the program. We have also clarified the regulations to require that a manufacturer must document and report the rejection to EPA as part of their normal reporting requirements under the program.

The second comment relates to making sure that the engines in the selected test vehicles are dissimilar. We proposed two basic different types of requirements to help ensure that the vehicles selected for testing within an engine family displayed variations in operating regimes and other usage characteristics. First, manufacturers were to recruit test vehicles from at least two different sources. Second, manufacturers were to submit a general test plan that was designed, in part, to identify if there was any bias, *i.e.*, pre-selection, in a manufacturer's recruiting program.

The Pennsylvania Department of Environmental Protection (PDEP) asked how we would ensure that a varying sample of engines within an engine family were tested. Specifically, they hypothesized that one fleet may have 10 vehicles with the same engine family, and that the engines may all have been produced on the same day under the same conditions. Further, PDEP suggested that it may be tempting for an engine manufacturer to test all these very similar engines. Therefore, they wondered if EPA had a strategy to ensure that test engines were produced at different times and for different fleets.

The concern expressed by PDEP is unlikely to be encountered since manufacturers are required to select vehicles from at least two different sources and submit to EPA detailed information on the vehicles they select. Further, even though the general plan is now a voluntary submission, we expect that manufacturers will normally provide this information. This will help ensure the manufacturer test programs

are reasonably diverse in test vehicles and conditions. Finally, EPA has the authority to conduct its own in-use testing if it has concerns with the representativeness of the manufacturers' test results.

The third comment regards setting adjustable parameters. We proposed that a manufacturer must set any adjustable parameter to the midpoint of its adjustable range prior to testing. Engine manufacturers asked that the requirement be expanded to allow an adjustment to the manufacturer's recommended setting. We agree with the comment and now allow an adjustable parameter to be adjusted to the manufacturer's recommended setting or the midpoint of its adjustable range prior to testing.

A fourth comment questions whether engine operating controls might be illegally recalibrated prior to testing. We proposed that engine manufacturers conduct a thorough screening of each engine before making any allowable adjustment or maintenance prior to testing. The results of this screening were to be reported to EPA. Also, manufacturers were required to screen each selected vehicle for proper use and maintenance and reject those vehicles which have not been properly maintained and used.

The PDEP commented that the process of implementing supplemental test procedures, *e.g.*, the NTE, was developed because engine manufacturers programmed their engines to recognize when they were being tested by the federal test procedure and when they were traveling on the highway. They asked if we had contingencies to stop engine manufacturers from re-flashing the vehicle's electronic control module in order to pass the screening process.

Obviously, a manufacturer that ''reflashed'' a vehicle's electronic control module during the screening process would not be generating a representative sample of emission results which is required when deciding whether an engine family is complying with the emissions standards. Further, that manufacturer could be modifying the emissions control system such that the engine is no longer covered by a certificate of conformity. In that situation, an engine could be in violation of Section 203 of the Clean Air Act and subject to civil penalties. We have the authority to void the certificate of conformity for an engine family if the engine manufacturer did not meet its obligation under the in-use testing rules. We also require manufacturers to report any steps they take to maintain, adjust, modify, or repair the vehicle or its engine prior to testing. Falsifying the emissions performance of an engine could constitute ground for voiding a certificate. A void certificate also results in a violation of Section 203 of the Clean Air Act and possible civil penalties because any sold engines are no longer covered by a certificate of conformity.

Finally, we do not anticipate manufacturers resorting to such practices and expect to physically participate in the manufacturer testing programs to some extent, including during vehicle screening and maintenance prior to testing. Finally, EPA will continue to conduct some level of its own in-use testing to validate the manufacturer's test results and gain confidence in their test programs.

*J. Test Conditions*

For all Phase 1 testing, we are requiring that test vehicles must to be operated over normal driving routes, carrying routine loads during normal atmospheric/environmental conditions, with the vehicle's normal owner/operator doing the driving. Our intent is to record the emissions from the test vehicles as they are used and operated on a normal day-to-day basis.

For Phase 2 testing, we may direct engine manufacturers to use a generic or specific test route and other conditions that replicate those observed in the Phase 1 testing that indicated a potential nonconformity. These other conditions may include but not be limited to specifying the State and/or contiguous States in which testing must be performed, or specifying the time period (of no less than 3 months in duration during which the testing must be performed. (This latter condition may also be used to ensure prompt testing of Phase 2 vehicles or to ensure testing during periods of particular atmospheric conditions.) In deciding to make these elections, we will take into account lead time and vehicle availability constraints.

We requested comment on whether EPA should similarly be allowed to direct a manufacturer to test specific engine configurations, test routes, and driving conditions for Phase 1 testing when we have particular information suggesting that these stipulations may help focus testing on areas where EPA has particular emission-related concerns. We believed that such an initial focus might not only improve the overall effectiveness of the in-use program, but might reduce the number of tests a manufacturer may otherwise need to conduct if Phase 2 testing is conducted for any reason.

Engine manufacturers commented that Phase 1 testing is meant to quickly screen vehicles for NTE compliance. Further, the manufacturers argued that specifying detailed test conditions for Phase 1 adds unacceptable complexities, time constraints, costs, and vehicle recruitment difficulties, and should not be adopted. After reviewing the engine manufacturers objections, we are not adopting a ''directed'' testing allowance in Phase 1.

*K. Reporting Requirements*

1. Comprehensive In-Use Testing Reports

Engine manufacturers will report test data and other relevant information to EPA on a regular basis. Specifically, manufacturers must send us reports for all engines tested during a calendar year quarter no later than 30 days after the quarter ends. Alternatively, manufacturers may send us a report for individual engines within 30 days after testing is completed.

These reports will be comprehensive in scope. Manufacturers must detail all emissions data, engine operating parameters, test conditions, test equipment specifications, vehicle and engine information generated during the manufacturer test program (*e.g.*, information on vehicle maintenance and usage history with reasons for rejected vehicles, restorative maintenance performed prior to testing), vehicle pass results, etc. Engine operating parameters include all information that is electronically sensed, measured, calculated, or otherwise stored by the engine's onboard computer. This must include, but is not limited to, engine speed, engine torque or brake specific fuel consumption, engine coolant temperature, intake manifold temperature, intake manifold pressure, and any parameter sensed or controlled in order to modulate the emissions control system. Manufacturers must also report any parameters used to modulate the emissions control system so that we can readily identify operation where an approved deficiency or carve-out applies, and the state of the engine during that operation.

Engine manufacturers will follow a standardized, electronic reporting format. We are currently developing the exact content and form of the reports with CARB and the engine manufacturers. Participation by CARB ensured that the reporting requirements are nationally consistent when it establishes an in-use NTE testing program of its own. The reporting requirements are detailed in the regulatory text accompanying today's

proposed rule. Additional details, including the final reporting format, will be published separately by EPA as a guidance document.

Engine manufacturers commented that our list of proposed data requirements was too extensive and overly burdensome. However, they acknowledged that the negotiated outline specifies the submission of a ''* * * comprehensive report * * *.'' The manufacturers also stated that the negotiated agreement called for a standardized reporting format to be jointly developed by EPA/CARB and the engine manufacturers. They noted that the proposed reporting format was not developed in the prescribed manner. Finally, they commented that until a jointly developed format has been completed, no final rule should be promulgated.

As noted above, we are developing the reporting format with the assistance of the engine manufacturers. We have entirely eliminated some of the items that we proposed manufacturers report based on their comments. These items have generally been moved to the record keeping requirements.

The engine manufacturers also commented that it may be more appropriate for manufacturers to submit reports upon the completion of Phase 1 or Phase 2 testing for a specific engine family instead of submitting reports on a calendar year basis for all engines tested during that quarter. They argued that this would consolidate information from a single phase of testing into a single report and would avoid the illogical inclusion of dissociated information from multiple families into the same report. Further, the manufacturers felt this would also ensure more timely reporting of information on completion of a phase of testing. Accordingly, they asked for the option of reporting either on a quarterly basis, as specified in the proposal, or 30 days after the completion of a specific phase of testing is concluded.

We envision that manufacturers will conduct engine family evaluations concurrently and that reporting in-use testing results on a calendar basis will provide the most timely and effective status updates of those testing programs. We also expect manufacturer testing to be continuous over multiple calendar quarters. A number of individual vehicles will likely be tested over that span of calendar quarters before a given phase of testing is complete. Waiting until the end of a phase of may not provide EPA sufficient opportunity to follow the progress of ongoing test programs. Our database will be designed to accept test results as they become available and update the database records in a logical manner for easy reading.

As mentioned previously, we are allowing 18 months for the in-use testing of any engine family be completed and fully reported to provide manufacturers with adequate lead time to properly planning and conducting the in-use test program. A manufacturer may request up to six addition months to complete and report Phase 2 test results if there is a reasonable basis for needing more time. Further, a manufacturer may request an additional six month extension. A successful request for this added extension will be limited to extraordinary circumstances beyond the control of the manufacturer and its customers whose vehicles are being tested. The testing and reporting period begins from the date EPA officially notifies the manufacturer that an engine family has been designated for in-use testing.

Engine manufacturers commented that they were dissatisfied with both the requirement to complete all testing of a designated engine family within 18 months, and the option to request a six-month extension for Phase 2 testing if justifiable. They concluded that it may be impossible to meet these deadlines in some cases, although no specific examples were provided. Instead, they asked that the provision be deleted or modified to allow unlimited extensions where circumstances dictate.

We believe that allowing unlimited extensions seems unnecessary and could result in engine families exhausting their useful lives before meaningful compliance data is generated. We also think that 18 months is sufficient to complete testing under normal circumstances. Manufacturers agreed to this in the settlement document, which states that data from the testing of a designated heavy-duty on-highway diesel engine family will be completed and reported to EPA and CARB within 18 months from of the designation of that family by EPA/CARB. In the proposal, we went even further and acknowledged there may be situations where an additional 6 months could be warranted due to unforseen and infrequent events. Therefore, we adopted the test and reporting period as proposed.

Nonetheless, we acknowledge that there might be some instances when unforseen complications may arise. In order to ensure the test program is successfully initiated with minimum burden to manufacturers, we will remain open to a request from any manufacturer for additional time beyond the 6 month extension. A successful request for this added extension will be limited to extraordinary circumstances beyond the control of the manufacturer and its customers whose vehicles are being tested. The threshold for such consideration is intended to be extremely high, and the frequency of such manufacturer requests, much less EPA approval, extremely low. In no instance, would the second deadline extension exceed 6 months. Finally, to the extent that any such additional extensions are needed, we would expect these to become non-existent as manufacturers gain experience with the in-use test program.

We are also adopting our proposal that allows us to obtain more information from the manufacturer than is specified in the reporting requirements if it is needed to evaluate whether an engine family meets the in-use testing requirements. Engine manufacturers commented that this allowance was an open-ended requirement that was unreasonable and unacceptable.

The allowance for us to request additional information is a general requirement common to all of EPA's regulations. There is nothing unique about the heavy-duty in-use test program that would diminish the important of this requirement. Therefore, we have retained it in the final rule.

2. Notification of Individual Vehicle Failures

We are requiring that manufacturers must ''quickly'' notify us when certain individual vehicles fail the vehicle pass criteria. The accelerated reporting period for failing vehicles is designed to afford EPA the opportunity to participate in the diagnosis of vehicle failures and any resulting follow-up activities. Specifically, we are requiring such notifications at two different points in the testing scheme. The first is when an engine family has experienced three failures in Phase 1 testing. This is the point where a manufacturer is fully committed to testing a total of 10 vehicles. Further, this is the threshold where, at the conclusion of Phase 1 testing, a manufacturer must join EPA in follow-up discussions to determine whether or not any further testing (*i.e.,* Phase 2), investigations, data submissions, or other actions may be warranted. We require that a manufacturer notify us by email within 15 days when the initial review of the test data for a selected engine family indicates that a third failure in Phase 1 testing has occurred.

The second point is each time a vehicle failure occurs during Phase 2 testing. In this case, we require a more immediate notification because of the increased significance of such failures. These failures are significant because of the greater likelihood of a possible nonconformance and the possibility that testing needs to be focused on specific vehicle configurations, environmental conditions, etc. In this phase of the program, we will require that a manufacturer notify us by email within 3 days when the initial review of the test data for a selected engine family indicates that a vehicle failure has occurred in Phase 2 testing.

In the proposal, we specified a more comprehensive scheme for rapidly reporting vehicle failures. Each individual vehicle failure needed to be reported to us within 15 days of conducting the emissions test. The report was comprehensive in nature. It included detailed emissions and engine data from the test in addition to any diagnostic results and conclusions. The manufacturers opposed the requirement, stating that the provision was unduly burdensome and unnecessary.

We continue to find that accelerated reporting of vehicle failures provides us with an important opportunity to participate in the diagnosis of failing vehicles and any resulting follow-up activities. This is no different than the opportunity we provide manufacturers in our own test programs. In light of the comment, however, we have reconsidered how our objective can be achieved while minimizing any associated reporting burden. As a result, we eliminated the comprehensive nature of the reporting requirement and made the requirement a simple notification when a potential failure has been observed. We also reduced the frequency of such notifications to the two points in the testing scheme as described above. These two points in the testing scheme were selected because that is where failures clearly become of sufficient interest to us that we may want to have the opportunity to participate in the test program.

3. Carve Outs, Deficiencies, or Other NTE Control Area Exclusions

Depending on the applicable standards, several provisions in the existing heavy-duty diesel engine regulations allow a manufacturer to temporarily exceed the NTE standards under certain limited circumstances, or otherwise exclude defined regions of the NTE engine control zone from NTE compliance. (See 65 FR 59912 and 59914 (October 6, 2000), and 66 FR 5040 (January 18, 2001)). These exceptions are also allowed in determining if a vehicle passes the vehicle pass criteria as described in section II. E. All such exclusions and associated test data must be fully described and submitted to us as part of the manufacturer's quarterly or 30-day emissions test result report that is required under the terms of the program.

More specifically, we are requiring that a manufacturer's report for each engine tested must describe the parameters that activate and de-activate each NTE deficiency as well as the engine load and speed points used to define an NTE carve-out tested under the program. This information must generally be in a form that can easily be used to determine whether a particular deficiency or carve-out was encountered when evaluating 1 Hz NTE test results. The information must be in a form that can be either loaded directly in EPA's electronic database or readily converted by us into the required data input structure.

For each NTE deficiency, the manufacturer must provide every engine and operational parameter(s) used to activate and deactivate the deficiency as well as the associated activation and deactivation thresholds. If more than one parameter is used to activate or deactivate a deficiency, the manufacturer must supply the logic that defines how those parameters interact. For any approved carve-out, manufacturers must provide the equation or equations that define the carve-out region as a function of engine load and speed. The engine computer must broadcast at 1 Hz, each parameter used to activate or deactivate a deficiency. EPA, CARB, and the engine manufacturers will jointly develop a template for submitting the information to EPA and CARB. This template will be included in a guidance document on this subject.

We requested comment on whether manufacturers should be required to electronically identify when the engine is operating in the area of an approved carve-out or deficiency and report that information as a data output to the portable emissions measurement systems. Flagging the presence of a carve-out or deficiency in such a manner appeared feasible as a relatively minor revision to the engine's on-board computer software. We envisioned the software changes would be limited to manipulating already broadcast or stored parameters. Electronic reporting of this information would ease the data analysis for the engines tested in the manufacturer-run, in-use testing program, and allow ready access to the same type of information for engines that may be tested in our own program using portable emission measurement systems.

Manufacturers commented that the requirement was too costly and time intensive. They stated that valuable electronic control module (ECM) processing capacity would be used just to provide an ''easy'' electronic indicator for NTE operation. Manufacturers provided no data or other information to support their claim that the requirement was ''too costly and time intensive.'' Upon further consideration, we recognize requiring manufacturers to add the electronic capability to flag NTE deficiencies and carve-outs as part of this rulemaking might present an unreasonable burden from the perspective of lead-time for the 2007 model year, which is less then two calender years away. We continue to believe that electronically reporting NTE deficiency and 5 percent limited testing region flags on a real time basis is necessary to improve the efficiency of collecting and analyzing in-use test data. EPA believes that the 2010 time frame would provide adequate time for manufacturers to begin implementing such an ECM-based reporting requirement. We intend to pursue this in a future rulemaking regarding onboard diagnostic systems for heavy-duty vehicles.

Regarding the availability of such information for use in our own in-use testing program, we can always request such information from a manufacturer in lieu of receiving it as part of the ECM read out. However, we want to ensure that these requests receive special handling to expedite our testing. We are, therefore, requiring that manufacturers provide engine information which clearly identifies the parameters defining all NTE deficiencies and parameters defining all NTE carve-outs for an engine family and associated power level when requested. Further, that the deficiencies and carve outs must be reported in sufficient detail for us to determine if a particular deficiency or carve-out will be encountered in the emission test data from the portable emission-sampling equipment and field-testing procedures. Such information is to be provided within 60 days of the request from EPA.

4. Incomplete, Invalid, or Voluntary Tests

We proposed that engine manufacturers must report all results from emissions testing, including incomplete tests, invalid tests, and additional tests that are voluntarily conducted.

The engine manufacturers objected to reporting results from the types of tests described above. They stated that such a requirement is overly burdensome and intrudes on a manufacturer's right to conduct voluntary tests without EPA ''supervision.'' Further, the manufacturers also specifically objected to reporting results when Phase 2 testing was voluntarily undertaken.

We continue to believe that the results of incomplete and invalid tests can yield valuable information regarding NTE emissions compliance and that it is legitimate to have access to this information within the context of the in-use program. However, to keep the reporting burden to a minimum, we will only require manufacturers to notify us in their formal reports when such tests were conducted for a selected engine family. Further, manufacturers will simply be required to keep all related test data and other relevant information as part of their recordkeeping in case we ask for it.

We disagree with the engine manufacturers suggestion that the results of testing should not be reported to EPA when a manufacturer voluntarily undertakes Phase 2 testing. In this instance, a manufacturer would be conducting the testing as a consequence of the Phase 1 test results. This follow-on testing is clearly a logical next step in the manufacturer-run, in-use testing program, and the results of such testing must be properly reported to EPA.

Regarding other voluntary tests that a manufacturer may conduct outside of the manufacturer-run, in-use testing program, we find that it is important for us to be aware when a manufacturer conducts such testing. Beyond providing valuable information, we want to prevent a situation where voluntary testing might be interpreted as having been conducted to screen test vehicles for passing results, which might then be submitted to us as valid tests under the in-use program. We do agree with the manufacturers, however, to the extend that our proposal could be interpreted as too broad and overly burdensome.

To accommodate these legitimate concerns, we have refined our requirements in this area as follows. First, we will limit this requirement to voluntary tests conducted on the same engine families that are being tested under the in-use test program. Second, we will focus the requirement on the period between the time the family is first selected for testing, until the final results of all testing for that family are reported to us. Third, as described above for invalid and incomplete tests, we will only require manufacturers to notify us in their formal reports when such tests were conducted for a selected engine family. The notification must clearly describe the purpose of the voluntary testing and how it is unrelated to the vehicle recruitment, screening, and testing conducted under the manufacturer-run, in-use testing program. Fourth, and finally, manufacturers will simply be required to keep all test data and other relevant information as part of their recordkeeping in case we ask to review it.

*L. Measurement of Emissions*

We are adopting the test procedures in 40 CFR part 1065 subpart J, ''Field Testing'' for conducting any emissions testing required in this program, as well as any other onboard testing required for heavy-duty engines under part 86, subpart N. These revised requirements are being promulgated as a companion rule to today's final manufacturer-run, in-use testing rulemaking.

We proposed to adopt the test procedures in part 1065, subpart J, ''Field Testing'' for conducting any emissions testing required in the in-use testing program, as well as any other onboard testing required for heavy-duty engines under part 86, subpart N. In our proposal, we noted that changes were being made to the then current version of part 1065, and that those revisions were being published in a separate companion Notice of Proposed Rulemaking (NPRM). The relevant proposed test procedures were generally described, and we asked that comments on the companion NPRM be directed toward that notice.

Manufacturers commented that the comment period on the in-use testing program be extended to align it with that of the companion test procedure proposal. They argued that the field testing provision had not yet been published and that this made it impossible to comment in total on the proposed in-use testing program. We chose not to extend the formal comment period for this rule, but have continued to exchange information with affected companies over an extended period up to the conclusion of the final rule. Manufacturers were able to provide any comments regarding the interaction of the regulations for this rule and the rule revising part 1065 during the comment period for that rule. There were no comments on that rule that would indicate that the effectiveness of this rule will be undermined by the proposals in that rule. We have addressed each of the comments submitted, as described elsewhere in this document, and in the companion rulemaking to adopt changes to the test procedures in 40 CFR part 1065.

1. Pollutants and Other Emissions

We are requiring the in-use measurement of the following pollutants from heavy-duty diesel engines: Non-methane hydrocarbons (NMHC), total hydrocarbons (THC), carbon monoxide (CO), oxides of nitrogen ($NO_X$), and particulate matter (PM). We are also requiring the measurement of carbon dioxide ($CO_2$) and oxygen ($O_2$) as a component of test measurement specifications and as a means of assuring quality control. Recognizing that experience may show that the effectiveness, durability and overall performance of new engine technologies and exhaust aftertreatment systems may demonstrate that in-use testing for certain pollutants is unnecessary, we will consider requests from the engine manufacturers to discontinue reporting and/or measurement of one or more pollutants from some or all engines based on future test experience.

In the proposal, we requested comments on requiring the in-use measurement of NMHC because it was not explicitly listed in the settlement agreement. We noted that the 2007 hydrocarbon standards for heavy-duty engines are written in terms of NMHC (or NMHCE) not THC. In addition, recent testing indicates that the traditional relationship of NMHC to THC in diesel exhaust (typically, NMHC is 98% of THC) is no longer applicable when aftertreatment like PM filters are used. Therefore, there is less of an exact correlation between THC and NMHC emissions and the traditional way of correlating such emissions in our regulations could lead to overestimation of NMHC emissions. Finally, NMHC can be measured on-vehicle without significant further effort. As a result, we believed the measurement of NMHC was justified.

Engine manufacturers objected to mandatory NMHC measurement. They also objected to being required to measure THC from diesel engines with catalyzed PM filters, arguing that the emission control technology results in negligible hydrocarbon emissions. However, the engine manufacturers wanted to have the option of measuring NMHC instead of THC if hydrocarbon measurement were required.

We are requiring the measurement of hydrocarbons in the in-use testing program and because NMHC is a regulated emission with an associated NTE standard, it must be reported. Commercially available portable measurement systems already report NMHC as the difference between

measured THC and methane (CH4) via dual FID/cutter technology. This measurement technology already meets all the NMHC requirements in Part 1065. Additionally, part 1065 provides the flexibility to report NMHC as the difference between measured THC and measured methane (CH4), or it may be reported as 0.98*THC. Therefore, manufacturers may optionally measure THC and report NMHC as 0.98*THC. However, we do not recommend this approach given the commercial availability of suitable portable technology that would yield a more accurate NMHC measurement.

Regarding the comment about ''negligible NMHC'' emissions, we believe that certain engines and exhaust aftertreatment systems can emit NMHC emissions at or above the NTE standard. This is particularly possible if the aftertreatment technology uses a hydrocarbon-based reducing agent, *e.g.*, diesel fuel, to ''regenerate'' the aftertreatment system. Nonetheless, in cases where a manufacturer can demonstrate that and engine and aftertreatment system combination negligible NMHC emissions, the manufacturer may petition EPA to waive associated measurement requirement, as we proposed and are now adopting.

Engine manufacturers also requested that hydrocarbon measurement not be required due to safety concerns with the hydrocarbon fuel used by the flame ionization detector (FID) in the portable analyzer to measure that pollutant. We have been using a unit produced by one manufacturer in our own in-use testing that is approved as safe by the Department of Transportation (DOT) for on-vehicle use. We expect that other manufacturers either have or will also DOT certify their devices for on-board emission measurement. In fact, we would not recommend using any portable device that utilizes FID fuel if it is not certified in conformance with DOT standards for such testing. Therefore, we disagree that the use of FID technology in the in-use test program necessarily poses a safety concern.

Manufacturers also commented that we should issue guidance that outlines reasonable conditions and procedures for manufacturers to follow in requesting an emission measurement waiver. We do not believe that a specific guidance document on this issue is necessary. The basic conditions and procedures for requesting an EPA waiver to avoid measuring a pollutant is obvious enough. Waivers will be reviewed on a case-by-case basis.

2. Portable Emission Measurement Systems—Status and Availability

Portable emission measurement systems will be used to measure the emissions and activity of vehicles tested in this program. Portable measurement systems have been under development for a little more than ten years. Currently, the status of these devices relative to their development and availability is different for gaseous and particulate emissions. Studies conducted by EPA, CARB, and the product manufacturers have shown that the technologies used in portable systems for gaseous emissions have been effective in accurately measuring emissions from in-use motor vehicles under the various conditions that could be expected in this test program. More specifically, commercial portable measurement systems have been available from a number of manufacturers since 2002 that measure THC, CO, and $NO_X$ emissions at the requisite exhaust concentrations associated with 2007 and later model year NTE standards. In 2004, units were introduced that measure NMHC, although some extra work is being instituted to verify the accuracy and precision of these new systems. Also, EPA is working on a program, with cooperation from ARB and the engine manufacturers, under which portable emission measurement systems will undergo comprehensive testing, including the identification of data-driven ''measurement allowances.'' A measurement allowance is an emissions-specific, brake-specific value that will be added to the NTE standard to determine an NTE threshold for the purposes of the manufacturer in-use testing program. Its purpose is to account for any differences between the accuracy of the portable measurement systems in the field and the accuracy of laboratory measurement systems in a lab. Additional details on this latter program are presented in section II. L. 3.

The development of portable systems for measuring PM has proven to be more challenging than the development of similar systems for measuring gaseous emissions. Currently, prototype portable systems for measuring PM are available from equipment manufacturers, and we have tested them in the laboratory with encouraging results. This demonstrates that the overall technology has been identified, although more work is needed to demonstrate its accuracy and efficacy in the laboratory and in the field for the purposes of the in-use testing program. In addition, work is continuing to miniaturize the on-board sampling devices and develop suitable exhaust dilution sampling techniques and hardware.

In our proposal, we acknowledged the significance of the development effort for PM portable measurement systems, especially with regard to being able to start the pilot program in 2005. Manufacturers echoed this concern in their comments. Specifically, we stated that if PM systems were not going to be available for the 2005 pilot program, we would consider delaying the PM requirement until 2006 or 2007, or temporarily relaxing the proposed equipment measurement tolerances. Consistent with that position, our current assessment of the state of portable PM emissions measurement systems has resulted in delaying the start of the pilot and fully enforceable programs for PM by one year from the dates contained in the proposed rulemaking.

We believe that the one-year delay for the PM pilot program (*i.e.*, 2006) will result in the availability of prototype portable devices capable of measuring these emissions as required. We also believe that the one-year delay for the fully enforceable program (*i.e.*, 2008) will result in useable, accurate, and precise portable units in time for use in that program. Our position is based on work that EPA, CARB, equipment manufacturers, and the engine manufacturers either have underway or have committed to performing to resolve the remaining development and verification issues, as described below. However, in recognition of the remaining uncertainties associated with these efforts, we have added a provision to the regulations that would suspend the in-use test program as it applies to PM measurement if we determine that fundamental technical problems with portable in-use PM measurement systems are not resolvable in a reasonable time.

As noted above, prototype portable units for measuring PM have been successfully tested in the laboratory, but further development work is needed to resolve some key challenges. The most significant of these are: Quantifying or weighing 30-second samples of semi-volatile hydrocarbons and dilute sulfuric acid PM at the NTE standard (*i.e.*, about 250 nanograms), proportionally diluting a partial flow of raw exhaust in order to sample PM at the same conditions as our laboratory procedures, and establishing a standard way of evaluating whether or not candidate systems actually meet these challenges. The work to resolve these remaining issues and to verify portable PM measurement technology in terms of

usability, accuracy and precision, can generally be divided into four program areas.

The first is our ongoing program that takes prototype portable PM measurement technology, which equipment manufacturers continue to refine, and compare the measurement capability of that hardware with current laboratory measurements. In this regard, we have recently acquired more sophisticated prototype devices for testing. We are evaluating a laboratory-scale quartz crystal microbalance (QCM) versus our laboratory PM measurement procedures. This evaluation is intended to verify whether or not prototype QCM technology reports PM similarly to the laboratory's reported values. We are confident that the QCM is a viable technology for the following reasons:

a. The QCM measures PM by electrostatically depositing mass on the QCM, and as PM deposits on the QCM its oscillating frequency changes in proportion to the total mass of the deposited PM. Because the QCM measures total PM mass directly by inertial acceleration, the QCM measures the same physical property; namely total mass, as compared to our laboratory filter-based procedure, which measures mass by gravitational acceleration (via a PM microbalance).

b. The design and construction of this technology is of a reasonable size and weight, and its power consumption indicates that this technology is likely to be sufficiently portable for on-vehicle use.

c. This PM PEMS technology is also specified to allow up to eight hours of continuous unattended operation so it will be appropriate for the HDIUT program.

d. Because QCM technology can measure ''nano-gram'' levels of PM, we believe that it is sufficiently sensitive to measure 30-second samples of PM at the NTE standard. For example, under typical dilution conditions in the NTE, 30 seconds of PM at the 2007 NTE standard (0.03 g/hp-hr) is in the range of 200 to 300 nanograms when sampled at one liter per minute, which is the sample rate of the QCM.

We intend to expand the work described above to include an already available portable partial-flow dilution system and a fully portable QCM.

The second is another internal EPA program that we anticipate beginning in the near future. In this program we will intend to develop techniques to generate ''reference PM'' in order to fully evaluate portable measurement systems using particles with similar physical characteristics and at the expected PM levels associated with the NTE standard and over intervals as short as 30 seconds.

The third is the PM pilot program. In the pilot, engine manufacturers will use best-available portable measurement systems as part of their testing. This program will give engine manufacturers an opportunity to evaluate the usability of these portable devices. We expect that information gained from this pilot program will be helpful for both EPA, equipment manufacturers, and engine manufacturers to prepare for the 2008 enforceable PM program.

The fourth is our cooperative research, development, and demonstration effort with CARB and the engine manufacturers. Under this comprehensive program, portable PM emission measurement systems will be rigorously tested and data-driven ''measurement allowances'' will be identified. Additional details on this program are presented in section II.L.3.

Based on the development and demonstration programs described above, as well as the ongoing work of equipment manufacturers, we remain optimistic that portable systems for PM testing will be available for the pilot program in 2006 and the fully enforceable in-use program starting in 2008.

The technical support document that accompanies today's final rulemaking contains more information on the status and development of portable emission measurement systems.

Engine manufacturers had some specific comments regarding the availability of portable emission measurement systems. Detroit Diesel Corporation commented that EPA failed to recognize that in order to begin production of 2007 model year engines with an appropriate level of confidence that those engines will meet in-use requirements, the availability of in-use measurement equipment will be required long before production of those engines begins. Specifically, the company referred to the need to conduct field validation of final engine calibrations as early as the winter of 2005/2006. Further, that testing would require equipment that has the capability for accurate measurement at below 1 gram/bhp-hr $NO_X$ development targets. Therefore, DDC concluded that it is unreasonable to expect that equipment being qualified at the 2.5 gram $NO_X$ level should also be adequate for development of engines at a 1 gram $NO_X$ level, and even more unreasonable to consider its use for developing at levels below the 0.2 gram $NO_X$ standard.

Our assessment shows that portable measurement systems with the capability to reliably measure $NO_X$ emission at the 2 g/bhp-hr level have been commercially available since 2002. Given that engine manufacturers are likely to certify MY2007-MY2010 engines at around the 1.1–1.3 g/hp-hr level, the corresponding NTE standard from MY2007–2010 will be about 2 g/hp-hr, depending upon vehicle mileage and other NTE flexibilities. Therefore, manufacturers could have started such field validation of final engine calibrations as early as about 2002. In fact, in 2003 Detroit Diesel Corporation gave public presentations showing how they are already using PEMS to field validate final engine calibrations. Therefore, we disagree with the comment in this area.

Also, as described in the previous section (see section II.L.2.), portable units that measure THC and CO have also been available since 2002. Units capable of measuring NMHC have been available since 2004. (Further work is needed on these instruments to determine their accuracy and precision, but compliance with the associated NTE standard can optionally be demonstrated by measuring THC, as explained in section II.L.1. of this preamble.)

Based on other comments, we acknowledge that compliance with NTE standards will require design engineers to better understand their engines' emission behavior over a wide range of possible engine operation, but we do not feel that access to field-testing systems at an early stage of engine development is a prerequisite for the successful development of engines that meet the NTE standards. Though claims have been made that NTE standards might be interpreted to cover a theoretically infinite degree of variability during in-use operation, we expect that by evaluating a range of in-use duty cycles a consistent level of control for any additional operation may be predicted. This evaluation may be conducted solely in a laboratory by making careful measurements over a statistically sound sampling plan. Such a statistically-based test plan provides reasonable certainty that any future emissions from an engine is likely to be within certain bounds. This approach is frequently used to ensure reliability of engine parts and engine performance even though an engine manufacturer never tests such parts or performance over an infinite number of in-use conditions. We expect a similar approach to be taken when designing engines to meet NTE standards.

Furthermore, we do not believe that manufacturers will need to test an ''infinite'' or inappropriately large number of steady state and transient

combinations with field test equipment. Rather, manufacturers will be able to quickly narrow their test programs in the laboratory to focus in on those areas of engine operation where emissions come closer to exceeding the NTE standards. Engineering experience and logic dictates that manufacturers will not expend resources testing areas where emissions are well understood and well below the NTE standards. Therefore, we expect that manufacturers can developed and demonstrate engine calibrations using existing portable measurement systems and normal engineering practices.

In another comment, engine manufacturers stated that the PM requirement was infeasible. They noted that verified portable sampling systems do not exist at this time. Further, they commented that PM emissions should not be included in the program until such time as validated, properly field-tested, on-vehicle devices become commercially available. Finally, the industry association commented that it is uncertain whether any portable measurement system can actually measure the same physical quantities as the filter-based method that is used in the laboratory, which is the basis for the regulatory definition of particulate, but also the underlying certification of heavy-duty diesel engines.

We have accommodated the engine manufacturers concerns with regard to the availability of suitable PM measurement equipment in a number of ways as described previously in this section. First, we have delayed the start of the pilot and fully enforceable programs for PM by one year from the dates contained in the proposed rulemaking to provide additional time to complete the development of these units. Second, we have committed to an internal EPA development program to resolve the remaining technical challenges with measuring PM emission onboard the vehicle. Third, we have entered into a comprehensive research, development, and demonstration program with CARB and the engine manufacturers to fully verify their usability, accuracy, and precision of portable PM measurement systems. Fourth, we have added a provision to the regulations that would suspend the in-use test program as it applies to PM measurement if we determine that fundamental technical problems with portable in-use PM measurement systems are not resolvable in a reasonable time. In summary, we believe there is an adequate basis to require PM measurement as part of the in-use testing program.

Regarding the comment that it is uncertain whether any portable measurement system can actually measure the same physical quantities as the filter-based method that is used in the laboratory, as noted above, quartz crystal microbalance measures PM by electrostatically depositing mass on the QCM, and as PM deposits on the QCM its oscillating frequency changes in proportion to the total mass of the deposited PM. Because the QCM measures total PM mass directly by inertial acceleration, the QCM measures the same physical property; namely total mass, as compared to our laboratory filter-based procedure, which measures mass by gravitational acceleration (via a PM microbalance).

The final comment regards measuring altitude (elevation) during an in-use test. In the draft technical support document, we noted that NTE testing will require specific information on a number of ambient conditions to determine if the engine is operating within the defined boundaries of the NTE or to calculate actual test results. We proposed to allow the direct measurement of these values with a specific technology or if the engine manufacturer determines that an engine's electronic control module (ECM) accurately quantifies these parameters, the manufacturer may rely on ECM values for those parameters. For altitude, we identified the use a global positioning system (GPS) as a suitable technology.

Detroit Diesel Corporation recommended that EPA also accept the sensing of barometric pressure as an adequate surrogate for altitude determination. They noted that detecting barometric pressure and determining the corresponding altitude using standard nominal barometric pressure versus altitude relationship has been practiced by the company and found to be reliable.

We believe that the guidance given in the draft technical support document remains appropriate. Direct measurement of the test altitude through GPS will be preferred as opposed to using a surrogate, *e.g.*, sensing barometric pressure) for determining altitude. Our preference is based on the understanding that there will likely be errors associated with relying on surrogates such as barometric pressure, since there would be other factors, *i.e.*, ambient conditions, inappropriately excluded from the altitude calculations. Nevertheless, as the final technical support document continues to state, we will allow the engine manufacturers to use the engine's ECM to determine altitude, but only if it can be demonstrated that it can be done accurately. This would be evaluated on a case-by-case basis.

A more detailed discussion of our response to engine manufacturers comments regarding the status of portable particulate measurement technology is contained in the summary and analysis of comments document that accompanies today's final rule.

3. Measurement Accuracy Margin Development Program

Manufacturer comments on the NPRM raised objections to EPA's proposed in-use accuracy margin value of five percent applicable to all pollutants covered by the program. As EPA sought clarification on these comments from the manufacturers and input from CARB, it became evident that there were legitimate concerns regarding whether or not the proposed accuracy margins had been sufficiently proven. In an effort to provide further data to develop final accuracy margins, EPA, CARB, and the engine manufacturers (through the Engine Manufacturers Association (EMA)) have entered into a Memorandum of Agreement (MOA) that details a project for developing data-driven accuracy margins for the gaseous emissions and PM fully enforceable programs. (See section II.F.3.i. of this preamble for more on the pilot program accuracy margins.) The MOA addresses the basic scope and objectives of the research, development and demonstration (RDD) program, program milestones and schedules, implementation issues, and intended implications for the regulations.

This RDD program is expected to be completed in two main phases. The first phase addresses gaseous emission accuracy margins, the second phase addresses PM accuracy margins. A full test plan has been prepared for the gaseous emissions RDD program; the test plan for the PM program is addressed in the MOA, and is to be completed well prior to initiation of the RDD testing effort. Each of the two programs is expected to be completed in time to have data driven accuracy margins for the respective fully enforceable programs, 2007 model year for gaseous emissions and 2008 for PM emissions. EPA intends to promulgate these accuracy margins and any related provisions through rulemaking.

The gaseous emissions RDD program contains four basic components. First, it will assess emissions, exhaust flow, and torque measurement variability of PEMS units incremental to the laboratory measurement. Second, the effect of environmental parameters and of on-vehicle time on measurement accuracy.

Third, on vehicle/trailer emission measurements versus PEMS emission measurements of the same operation. And fourth, it will consider manufacturer voluntary submissions of data that could be used to develop a margin component that accounts for the variability in key engine parameters used in the NTE brake-specific emission calculations. All of this information will be used to develop and validate a computer model which will produce a data driven accuracy margin for each of the gaseous emissions to be proposed as discussed above.

The PM emissions RDD program, scheduled to begin in 2006, will assess the same basic questions as laid out above. Its schedule is offset by approximately one year to allow for full development of the PM RDD test program plan and continued development of PM PEMS capability. The PM accuracy margins and any related provisions are expected to be promulgated through rulemaking, with the intention that they apply to the 2008 model year fully enforceable program for PM emissions.

The efforts under this MOA will be managed by EPA in close coordination with CARB and the involved engine manufacturers. Progress reports will be made publicly available. Interested readers are invited to review the full text of the MOA which is available in the public docket and at the EPA/OTAQ website for this rule.

*M. Pilot Program*

To ensure a successful launch of the fully enforceable program for gaseous emissions testing in calendar year 2007, there will be a more limited mandatory pilot program in calendar years 2005 and 2006 for gaseous pollutants (*i.e.*, nonmethane hydrocarbons (NMHC), carbon monoxide (CO), and oxides of nitrogen ($NO_X$)). Similarly, the fully enforceable program for PM will be preceded by a pilot program for that pollutant in calendar years 2006 and 2007. Additionally, one or both of the pilot programs could be extended, and the fully enforceable program delayed, in the unlikely event that the process of identifying the final accuracy margins, discussed above, is significantly delayed beyond the originally scheduled completion dates.

We will designate engine families for testing under the pilot program as described in section II. B. of this preamble. In all likelihood, we will select 2002 through 2006 model year engines for testing under the gaseous pilot program, and 2002 through 2007 model year engines under the PM pilot program. As discussed above, we will only designate families that have been designed to comply with the NTE. After receiving our selections, manufacturers will then conduct in-use testing based on the Phase 1 testing criteria according to the scheme set forth in section II. C. of this preamble. Under those requirements, engine manufacturers must test up to 10 vehicles per designated engine family. However, Phase 1 testing will be limited to a total of five vehicles for engine manufacturers participating in the program to develop the final measurement accuracy margins for portable emission measurement systems as described in section II. L. 3. of this preamble. During the two-year pilot programs for gaseous and PM emissions, both EPA and the heavy-duty diesel engine manufacturers will gain valuable experience with the in-use testing protocols, and the generation, interpretation, and reporting of in-use NTE emissions data.

The evaluation of these data for compliance purposes is limited to screening for exceedences of the FTP certification standards as well as the potential use of defeat devices as outlined in prior Agency guidance. The pilot program data could also be used to screen consent decree engines certified to pull ahead NTE requirements for compliance with the applicable NTE limits. If the test results for manufacturers subject to the full pilot program clearly show that the designated heavy-duty diesel engine family passes the Phase 1 testing criteria (*i.e.*, 5 out of 5, 5 out of 6, or 8 out of 10 vehicles pass), no further testing will be required of that engine family in that year. If the designated engine family does not clearly pass the test criteria (*i.e.*, 7 or fewer out of 10 vehicles pass) we will not pursue any form of remedial action based solely on that data. For manufacturers participating in the program to develop the final accuracy measurement margins that must test five vehicles per designated engine family, we will likewise not pursue any form of remedial action based solely on that data. However, we may utilize these latter test results in conjunction with our own test data and other information to assess or pursue any appropriate enforcement or regulatory action.

We proposed that the certificate of conformity for an engine family may be voided if the engine manufacturer did not meet its obligations under the in-use testing rules. International Truck and Engine Company commented that during the settlement negotiations, all parties recognized that the 2005 and 2006 pilot programs must remain flexible in order for it to work. Therefore, the potential consequences of voiding a certificate of conformity for failing to strictly adhere to the 2005 and 2006 pilot programs directly contradicts the cooperative nature of the in-use testing program.

We agree with the commenter that the pilot program needs to remain flexible and cooperative in nature. However, we are retaining the provision for the pilot program as a way to assure that all engine manufacturers participate in that part of the mandatory in-use testing pilot program. We do not anticipate a reason to revoke a certificate of conformity if the manufacturer shows a good faith effort in conducting the pilot program.

*N. Public Availability of In-Use Testing Data*

We noted in the proposal that in-use test data reported under the program would be available to the general public for review and analysis. The engine manufacturers objected to providing public access to all test data and underlying information. They specifically stated that information pertaining to how a manufacturer ''controls'' an engine when achieving in-use emissions compliance is confidential business information and must be treated as such. Manufacturers stated that public information should be limited to emission results and vehicle pass ratios.

Our goal is to ensure the confidentiality a manufacturer's confidential business information (CBI) while making the in-use test program as transparent and useful to others as possible. After carefully considering how to balance these competing interests, we will make the following information publically available: Engine family, model, and rating identification; description of test route and test conditions; engine speed and torque, mass emissions, and work performed each at a 1 Hz interval; emissions results (for each valid NTE event); vehicle pass ratio; and any other information needed to calculate the summary emissions results and the NTE zone for that engine. We will also make available a generic indication as to whether a deficiency or carve-out has been encountered for each second of the test. Information that a manufacturer may designate as CBI will be safeguarded and withheld from public release by the Agency subject to EPA's CBI regulations.[11] Except as listed above as

[11] If EPA receives a request under the Freedom of Information Act for records relating to manufacturers' required in-use testing, it is EPA's standard operating procedure to initially deny the

publically available, such information will include, but is not limited to, engine operating and control parameters designated CBI during the certification process (including those associated with auxiliary emissions control devices) and the information necessary to identify specific and complete regions of the NTE control zone where: (1) A manufacturer has been granted an allowance by EPA to temporarily exceed the NTE standards under certain limited circumstances (*i.e.*, deficiencies), or (2) the emissions contribution from a portion of the NTE zone has been limited in determining compliance with the NTE standards (*i.e.*, carve-outs).

*O. Implications for Other EPA Programs*

1. EPA Testing and Supplemental Information

EPA reserves its preexisting authority to conduct repeat testing or initiate our own in-use testing of a manufacturer's heavy-duty diesel engine family. The purpose of this testing would be primarily to verify and supplement, not duplicate, the testing program to be conducted by manufacturers. Therefore, we do not intend to conduct routine in-use NTE testing of engines or engine families that satisfy the Phase 1 testing criteria, unless new information indicates that a potential nonconformity exists. We will also inform and invite the affected manufacturer to observe any in-use testing that we may conduct which is related to this program.

2. Selective Enforcement Audit (SEA) Testing

We will limit the existing SEA program after full implementation of the manufacturer-run, in-use program solely to instances where credible evidence indicates the existence of a nonconformity. Such evidence may include: Past noncompliance occurring in new engines or very early in the life of in-use engines, a manufacturer's quality assurance/quality control (QA/QC) reporting that identifies or otherwise indicates a problem, a significant number of consumer complaints or defect reports, or test data of any type.

In general, we anticipate that a robust, mature manufacturer-run in-use program would significantly reduce the role SEA plays in EPA's compliance program. Assembly line emissions audits ensure that the prototype emission control designs approved during the certification process successfully transfer into mass produced engines. More specifically, SEAs evaluate whether manufacturers' design enough compliance margin into the certified emissions levels to account for the emissions variability inherent to the design and manufacture of a particular engine and emissions control system.

It is expected that the in-use program will require manufacturers to target emissions performance with enough compliance margin below the standards to account for expected in-use deterioration, and that this margin will exceed normal emissions variability experienced in new engines. The use of aftertreatment as the primary means for emissions control is expected further to reduce EPA's reliance on SEAs as a compliance tool. These systems typically function at high efficiency levels and without catastrophic failure on newer engines. If problems were to occur, it is often only apparent after the aftertreatment-equipped engine has been in service for some period of time. During SEA testing, the aftertreatment system will have experienced little mileage accumulation and, therefore, is expected to perform at essentially undeteriorated levels. For these reasons, EPA believes SEA testing will be less critical for a vigorous enforcement program.

As mentioned previously, there are circumstances where SEAs would still be warranted. Those situations typically involve known or expected problems which occur relatively early in the engine's useful life, but have not been remedied by the manufacturer. In those cases, it is less expensive and more effective to remedy the problem well in advance of in-use testing. EPA is also interested in occasionally conducting SEAs for small engine families that may not be the focus of testing under the manufacturer-run, in-use testing program.

3. Deterioration Factor Testing

Under our current emissions certification program requirements, manufacturers of heavy-duty diesel engines are allowed considerable flexibility in generating deterioration factors (DFs). The regulations only generally specify how to stabilize the engine system prior to conducting the durability testing. All other aspects of generating DFs, such as the durability test cycle and the duration of the testing, are left to the good engineering judgement of the engine manufacturer. Given this latitude, manufacturers have settled on a fairly standard set of methodologies for generating DFs.

Deterioration factors are generated in the laboratory using an engine dynamometer. After the engine is stabilized, it is exercised over a durability driving cycle for a period of time or mileage established by the engine manufacturer as mentioned previously. Emissions are measured over this cycle at intervals specified by the engine manufacturer. The measured emissions are plotted as a function of time or mileage and a statistical curve fitting method is used to calculate emissions deterioration over time. Since the emission tests are not typically performed to the end of engine's useful life, the curve-fit is extrapolated to estimate useful life emissions. Either the measured initial, early-life emissions are subtracted from the extrapolated useful life emissions (additive DF), or the useful life emissions are divided by the early-life emissions (multiplicative DF), depending on the emissions control technology, to calculate the DF and arrive at the official deteriorated certification test results.

The 2004 and 2007 low emission standards required for heavy-duty diesel engines has placed the efficacy of how these traditional DF methodologies are developed and applied under increased scrutiny by both EPA and the engine manufacturers. The reasons are twofold. First, aftertreatment and add-on emissions control technologies such as cooled-EGR are more prone to deterioration compared to past engine designs. Second, compliance with the emissions standards becomes more sensitive to the uncertainty in the emissions trends resulting from these common DFs methods as the stringency of the standards increases. In the past, manufacturers could target emissions far enough below the relatively relaxed emissions standards in order to account for the inherent DF variability. The increased stringency of the 2004 and 2007 standards have reduced those traditional compliance margins, leaving less headroom to account for DF uncertainty. Exacerbating the issue is the traditional use of multiplicative DFs which mathematically result in a larger deteriorated emissions value compared to an additive approach.

The most likely solution for addressing the loss in confidence with current DF methods in the near term is for EPA and the engine manufacturers to work cooperatively to establish more robust accelerated DF methodologies in the laboratory. This would provide more certain deteriorated certification emission results. Discussions on such a solution have already started on an

requestor any responsive records containing information submitted under CBI claims by the manufacturers. The manufacturers who submitted the information under CBI claims will be required to substantiate their claims, and the EPA Office of General Counsel will make a final determination of confidentiality for the information. *See* 40 CFR 2.204 and 205.

informal basis with individual manufacturers and will become more structured with industry in the near future.

As a longer term approach, it may be possible to reduce or eliminate the current laboratory-based DF methods by using the test results generated as part of the proposed manufacturer-run in-use testing program or test data from other in-use testing that utilizes portable emission measurement systems to more accurately predict in-use deterioration. For example, a manufacturer may be able to demonstrate that DFs generated from the in-use data are superior predictors of useful life deterioration, or at least correlate well with the more traditional laboratory approach to developing these factors. To this end, we intend to assess the generation and submission of DFs based on the proposed 2005 and 2006 pilot program. We will examine potential ways to diminish or eliminate burdens on manufacturers of generating and submitted DFs, while still generating DFs that accurately predict in-use deterioration. Any appropriate revisions for generating DFs would be promulgated in a subsequent rulemaking action, particularly in the rulemaking reexamining the accuracy margin discussed in II. F. above.

*P. Limitations of Warranty Claims*

An exceedence of the NTE found through the in-use testing program is not by itself sufficient to show a breach of the warranty under section 207(a)(1)(A) or (B). A breach of this warranty would also require either: (1) That, at the time of sale, the engine or vehicle was designed, built and equipped in a manner that does not conform in all material respects reasonably related to emission controls to the engine as described in the application for certification and covered by the certificate, or (2) a defect in materials and workmanship of a component or part that causes the vehicle or engine to fail to conform to the applicable regulations for its useful life. To the extent that in-use NTE testing does not reveal such a material deficiency at the time of sale in the design or manufacture of an engine compared to the certified engine, or a defect in the materials and workmanship of a component or part, test results showing an exceedence of the NTE by itself would not show a breach of the warranty under section 207(a)(1).

## III. Economic Impacts

The costs associated with the rule to implement a manufacturer-run, in-use NTE testing program for heavy-duty diesel engines depends primarily on how many vehicles are eventually tested under the Phase 1 and 2 testing schemes. This is difficult to estimate because the actual number for each designated engine family depends on how may vehicles pass, or fail, the vehicle pass criteria at various points in the tiered testing design. It is also highly dependent on how manufacturers chose to conduct the test program and the availability of test vehicles. However, based on our experience with in-use emissions testing, including the development and use of portable measurement systems for compliance testing, and comments from an engine manufacturer, we identified a reasonable testing scenario that allows us to estimate the potential costs associated with the program. This analysis is based on 13 manufacturers who certified 71 engine families in 2005. Costs are in 2004 dollars.

Our analysis shows a total cost of approximately $1.6 million per year for the case where no manufacturer must test more than the minimum number of vehicles under Phase 1 (*i.e.*, 5 vehicles per engine family). If all manufacturers were to test the maximum number of vehicles required under Phase 1 (*i.e.*, 10 vehicles per engine family), the total cost would be about $1.7 million per year. In the most unlikely worst case scenario where all manufacturers must test the maximum vehicles in Phase 1 and 2 (*i.e.*, 20 vehicles per engine family), the total cost would be about $2.1 million per year. Our best estimate of the overall cost of the proposed program is $1.7 million per year for the entire industry. The Technical Support Document for this rule contains a detailed description of our economic analysis.

Overall, while not insignificant, these costs are quite low compared to other in-use compliance programs. Moreover, they are especially attractive in comparison to a more traditional in-use testing program where the engine must be extracted from the vehicle and tested on an engine dynamometer in the laboratory. In that situation, each engine test could cost $25,000 if the vehicle could be procured from an in-use fleet.

## IV. Public Participation

In the proposed rule, we invited public participation in a public hearing and a comment period for written comments. We held the public hearing on July 15, 2004 to receive comments on the rule. Only the on-highway, heavy-duty diesel engine manufacturers that are affected by the rule presented testimony. We also received written comments from about 10 organizations, ranging from State offices of environmental protection to the engine manufacturers. The previous sections of this preamble describe the significant comments and our responses. The Final Technical Support Document addresses the full range of comments.

## V. Statutory and Executive Order Reviews

*A. Executive Order 12866: Regulatory Planning and Review*

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

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The Office of Management and Budget reviewed this rule under the provisions of Executive Order 12866. Any new costs associated with this rule will be small. See the Technical Support Document for more information.

*B. Paperwork Reduction Act*

The Office of Management and Budget (OMB) has approved the information collection requirements contained in this rule under the provisions of the *Paperwork Reduction Act,* 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2060–0287 (EPA ICR #1684.08). The Agency will collect information to ensure compliance with the provisions in this rule. Section 208(a) of the Clean Air Act requires that engine manufacturers provide information the Administrator may reasonably require to determine compliance with the regulations; submission of the information is therefore mandatory. We will consider confidential all information meeting the

requirements of Section 208(c) of the Clean Air Act.

As shown in Table V–1, the total annual burden associated with this proposal is about 3,614 hours and $1,669,000 based on a projection of 13 respondents. The estimated burden for on-highway, heavy-duty diesel engine manufacturers is a total estimate for both new and existing reporting requirements. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; and transmit or otherwise disclose the information.

TABLE V–1.—ESTIMATED BURDEN FOR REPORTING AND RECORDKEEPING REQUIREMENTS

| Industry sector | Number of respondents | Annual burden hours | Annual costs |
|---|---|---|---|
| Engines | 13 | 3,614 | $1,669,000 |

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

*C. Regulatory Flexibility Act*

EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with this final rule.

For purposes of assessing the impacts of this final rule on small entities, a small entity is defined as: (1) A small business as defined by the Small Business Administration (SBA)'s regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, EPA has concluded that this action will not have a significant economic impact on a substantial number of small entities. This final rule will not impose any requirements on small entities. The test procedures that are established by this rule pertain to heavy-duty diesel engine manufacturers. EPA has previously analyzed this category for impact on small entities when emission standards were finalized for this category of engines in October of 2000 (65 FR 59895, October 6, 2000). At that time, EPA noted that two small entities were known to be affected. Those entities were small businesses that certify alternative fuel engines or vehicles, either newly manufactured or modified from previously certified gasoline engines. The test procedures adopted by this action do not pertain to the engines manufactured by these small businesses and recent analysis supports that there are no additional small businesses that would be impacted by this action.

*D. Unfunded Mandates Reform Act*

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

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

This rule contains no Federal mandates for State, local, or tribal governments as defined by the provisions of Title II of the UMRA. The rule imposes no enforceable duties on any of these governmental entities. Nothing in the rule significantly or uniquely affects small governments. We have determined that this rule contains no Federal mandates that may result in expenditures of more than $100 million to the private sector in any single year. The requirements of UMRA, therefore, do not apply to this action.

*E. Executive Order 13132: Federalism*

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

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

regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

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

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

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

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.''

This rule does not have tribal implications as specified in Executive Order 13175. This rule will be implemented at the Federal level and impose compliance costs only on heavy-duty diesel, on-highway engine manufacturers. Tribal governments will be affected only to the extent they purchase and use equipment with regulated engines. Thus, Executive Order 13175 does not apply to this rule.

*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, Section 5–501 of the Order directs the Agency to evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This rule is not subject to the Executive Order because it does not involve decisions on environmental health or safety risks that may disproportionately affect children.

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

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant effect on the supply, distribution, or use of energy.

*I. National Technology Transfer Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Pub. L. 104–113, Section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. There are no voluntary consensus standards for the testing required under this final rule.

*J. 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**. This rule is not a ''major rule'' as defined by 5 U.S.C. 804(2). The Office of Management and Budget reviewed this rule under the provisions of Executive Order 12866. Any new costs associated with this final rule will be minimal.

**VI. Statutory Provisions and Legal Authority**

Statutory authority for the engine controls adopted in this rule is in 42 U.S.C. 7401–7671q.

**List of Subjects**

*40 CFR Part 9*

Reporting and recordkeeping requirements.

*40 CFR Part 86*

Environmental protection, Administrative practice and procedure, Confidential business information, Incorporation by reference, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

Dated: June 3, 2005.

**Stephen L. Johnson,**

*Administrator.*

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

## PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

■ 1. The authority citation for part 9 continues to read as follows:

**Authority:** 7 U.S.C. 135 *et seq.*, 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1318 1321, 1326, 1330, 1342 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.*, 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

■ 2. Section 9.1 is amended in the table by removing the heading ''Control of Air Pollution From New and In-Use Motor Vehicles and New and In-Use Motor Vehicle Engines: Certification and Test Procedures'' and adding the following new heading in its place ''Control of Emissions From New and In-Use Highway Vehicles and Engines'' and a new entry under the heading in numerical order to read as follows:

**§ 9.1 OMB approvals under the Paperwork Reduction Act.**

* * * * *

| 40 CFR citation | OMB control No. |
|---|---|
| * * * * * | |
| **Control of Emissions From New and In-Use Highway Vehicles and Engines** | |
| * * * * * | |
| 86.1920—86.1925 ..... | 2060–0287 |
| * * * * * | |

## 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.

■ 4. Section 86.1 is amended by adding an entry at the end of the table in paragraph (b)(1) and adding paragraph (b)(6) to read as follows:

**§ 86.1 Reference materials.**

* * * * *

(b) * * *

(1) * * *

| Document No. and name | 40 CFR part 86 reference |
|---|---|
| * * * * * | |
| ASTM D 975–04c Standard Specification for Diesel Fuel Oils ..... | 86.1910 |

* * * * *

(6) *NIST material.* The following table lists material from the National Institute of Standards and Technology that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Government Printing Office, Washington, DC 20402 or download them from the Internet at *http://www.nist.gov/.*

| Document No. and name | Part 86 reference |
|---|---|
| NIST Special Publication 811, Guide for the Use of the International System of Units (SI), 1995 Edition. ..... | 86.1901 |

■ 5. Section 86.007–11 is amended by adding paragraph (a)(4)(vi) to read as follows:

**§ 86.007–11 Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles.**

* * * * *

(a) * * *

(4) * * *

(vi) Manufacturers are not required to provide engine information exclusively related to in-use testing as part of initial certification. However, upon request from EPA the manufacturers must provide the information which clearly identifies parameters defining all NTE deficiencies described under paragraph (a)(4)(iv) of this section and parameters defining all NTE limited testing regions described under § 86.1370–2007(b)(6) and (7) that are requested. When requested, deficiencies and limited testing regions must be reported for all engine families and power ratings in English with sufficient detail for us to determine if a particular deficiency or limited testing region will be encountered in the emission test data from the portable emission-sampling equipment and field-testing procedures referenced in § 86.1375. Such information is to be provided within 60 days of the request from EPA.

* * * * *

■ 6. A new § 86.1375–2007 is added to read as follows:

**§ 86.1375–2007 Equipment specifications for field testing.**

For testing conducted with engines installed in vehicles, including field testing conducted to measure emissions under Not-To-Exceed test procedures, use the test procedures and equipment specified in 40 CFR part 1065, subpart J.

■ 7. A new subpart T is added to read as follows:

## Subpart T—Manufacturer-Run In-Use Testing Program for Heavy-Duty Diesel Engines

Sec.



**§ 86.1901 What testing requirements apply to my engines that have gone into service?**

(a) If you manufacture diesel heavy-duty engines above 8500 lbs. GVWR that are subject to engine-based exhaust emission standards under this part, you must test them as described in this subpart. You must measure all emissions listed in § 86.1910(d) other than PM beginning in calendar year 2005 and you must measure PM emissions beginning in calendar year 2006. See §§ 86.1930 and 86.1935 for special provisions that may apply to manufacturers in the early years of this program.

(b) We may void your certificate of conformity for an engine family if you do not meet your obligations under this subpart. We may also void individual tests and require you to retest those vehicles or take other appropriate measures in instances where you have not performed the testing in accordance with the requirements described in this subpart.

(c) In this subpart, the term ''you'' refers to the certificate-holder for any engines subject to the requirements of this subpart.

(d) In this subpart, *round* means to round numbers according to NIST Special Publication 811(incorporated by reference in § 86.1).

**§ 86.1905 How does this program work?**

(a) You must test in-use engines from the families we select. We may select the following number of engine families for testing, except as specified in paragraph (b) of this section:

(1) We may select up to 25 percent of your engine families in any calendar year, calculated by dividing the number of engine families you certified in the model year corresponding to the calendar year by four and rounding to the nearest whole number. We will consider only engine families with annual U.S.-directed production volumes above 1,500 units in calculating the number of engine families subject to testing each calendar year under the annual 25 percent engine family limit. In addition, for model year 2007 through 2009, identical engine families that are split into two subfamilies under § 86.007–15(m)(9) will count as only one engine family. If you have only three or fewer families that each exceed an annual U.S.-directed production volume of 1,500 units, or if you have no engine families

above this limit, we may select one engine family per calendar year for testing.

(2) Over any four-year period, we will not select more than the average number of engine families that you have certified over that four-year period (the model year when the selection is made and the preceding three model years), based on rounding the average value to the nearest whole number.

(b) If there is clear evidence of a nonconformity with regard to an engine family, we may select that engine family without counting it as a selected engine family under paragraph (a) of this section. We will consult with you in reaching a conclusion whether clear evidence of a nonconformity exists for any engine family. In general, there is clear evidence of a nonconformity regarding an engine family under this subpart in any of the following cases:

(1) The engine family was not remedied but is a carry-over from an engine family you tested under this subpart and was subsequently remedied based at least in part on the Phase 1 or Phase 2 testing outcomes described in § 86.1915.

(2) The engine family was not remedied but is a carry-over from an engine family that was remedied based on an EPA in-use testing program.

(c) We may select any individual engine family for testing, regardless of its production volume, as long as we do not select more than the number of engine families described in paragraph (a) of this section. We may select an engine family from the current model year or any previous model year, except that we will not select any engine families from model years before 2007 beginning in the following calendar years:

(1) 2007 for all emissions testing other than PM testing.

(2) 2008 for PM testing.

(d) You must complete all the required testing and reporting under this subpart within 18 months after we direct you to test a particular engine family. We will typically select engine families for testing and notify you in writing by June 30 of the applicable calendar year. You may ask for up to six months longer to complete Phase 2 testing if there is a reasonable basis for needing more time. In very unusual circumstances you may request an additional six months to complete Phase 2 testing.

(e) If you make a good-faith effort to access enough test vehicles to complete Phase 1 or Phase 2 testing requirements under this subpart for an engine family, but are unable to do so, you must ask us either to modify the testing requirements for the selected engine family or, in the case of Phase 1 testing, to select a different engine family.

(f) After you complete the in-use testing requirements for an engine family that we selected for testing in a given calendar year, we may select that same family in a later year to evaluate the engine family's compliance closer to the end of its useful life. This would count as an additional engine-family selection under paragraph (a) of this section, except as described in paragraph (b) of this section.

(g) For any communication related to this subpart, contact the Engine Programs Group Manager (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

**§ 86.1908 How must I select and screen my in-use engines?**

(a) Once we direct you to do testing under this subpart, you must make arrangements to select test vehicles and engines that meet the following criteria:

(1) The engines must be representative of the engine family.

(2) The usage of the vehicles must be representative of typical usage for the vehicles' particular application.

(3) The vehicles come from at least two independent sources.

(4) The key vehicle/engine systems (*e.g.*, power train, drive train, emission control) have been properly maintained and used.

(5) The engines have not been tampered with, rebuilt or undergone major repair that could be expected to affect emissions.

(6) The engines have not been misfueled. For example, an engine may be considered misfueled if operated on a biodiesel fuel blend that is either not listed as allowed or otherwise indicated to be an unacceptable fuel in the vehicle's owner or operator manual.

(7) The engines do not have an illuminated MIL or stored OBD trouble code that lead you to reject the vehicle from the test program as described in § 86.1910(b)(2).

(8) The vehicles are likely to operate for at least three hours (excluding idle) over a complete shift-day, as described in § 86.1910(g).

(9) The vehicles have not exceeded the applicable useful life, in miles or years (see subpart A of this part); you may otherwise not exclude engines from testing based on their age or mileage.

(10) The vehicle has appropriate space for safe and proper mounting of the PEMS equipment.

(b) You must keep any records of a vehicle's maintenance and use history you obtain from the owner or operator, as required by § 86.1925. You must report the engine's maintenance and use history and information related to the OBD system, as described in § 86.1920.

(c) You must notify us before rejecting a candidate vehicle for reasons other than failing to meet the acceptance criteria in paragraph (a) of this section. A candidate vehicle is any prospective vehicle you have identified to potentially fulfill your testing requirements under this subpart. Include your reasons for rejecting each vehicle. If an owner declines to participate in the test program, you may reject the vehicle without prior notification. Such a rejection must be reported as described in § 86.1920. We may allow you to replace the rejected vehicle with another candidate vehicle to meet your testing requirements for the specific engine family.

(d) You must report when, how, and why you reject candidate vehicles, as described in § 86.1920.

**§ 86.1910 How must I prepare and test my in-use engines?**

(a) You must limit maintenance to what is in the owners manual for engines with that amount of service and age. For anything we consider an adjustable parameter (*see* § 86.094–21(b)(1)(ii) and § 86.094–22(e)), you may adjust that parameter only if it is outside of its adjustable range. You must then set the adjustable parameter to the mid-point of its adjustable range or your recommended setting, unless we approve your request to do otherwise. You must receive permission from us before adjusting anything not considered to be an adjustable parameter. You must keep records of all maintenance and adjustments, as required by § 86.1925. You must send us these records, as described in § 86.1920(b)(3)(x), unless we instruct you not to send them.

(b) You may treat a vehicle with an illuminated MIL or stored trouble code as follows:

(1) If the length of MIL illumination or trouble code storage is consistent with proper maintenance and use, either test the prospective test vehicle as received or repair the vehicle before testing. If you elect to repair the vehicle/engine, but ultimately determine that repairs cannot be completed in a timely manner, you may reject the vehicle from the test program and replace it with another vehicle. If you repair or reject the vehicle, you must describe the MIL or trouble code information in your report under § 86.1920.

(2) If the length of MIL illumination or trouble code storage is inconsistent with proper maintenance and use, either

test the prospective test vehicle as received, repair the vehicle before testing, or reject the vehicle from the test program and replace it with another vehicle. If you repair or reject the vehicle, you must describe the MIL or trouble code information in your report under § 86.1920.

(3) If a MIL is illuminated or a trouble code is set during an in-use test, do one of the following:

(i) Stop the test, repair the vehicle, and restart the testing. In this case, only the portion of the full test results without the MIL illuminated or trouble code set would be used in the vehicle-pass determination as described in § 86.1912. Describe the MIL or trouble code information in your report under § 86.1920.

(ii) Stop the test, repair the vehicle, and initiate a new test. In this case, only the post-repair test results would be used in the vehicle-pass determination as described in § 86.1912. Describe the MIL or trouble code information in your report under § 86.1920.

(iii) If three hours of non-idle operation have been accumulated prior to the time a MIL is illuminated or trouble code set, stop the test and use the accumulated test results in the vehicle-pass determination as described in § 86.1912.

(iv) If three hours of non-idle operation have not been accumulated prior to the time a MIL is illuminated or trouble code is set, and you elect to repair the vehicle/engine, but ultimately determine that repairs cannot be completed in a timely manner, you may reject the vehicle from the test program and replace it with another vehicle. If you repair or reject the vehicle, you must describe the MIL or trouble code information in your report under § 86.1920.

(c) Use appropriate fuels for testing, as follows:

(1) You may use any diesel fuel that meets the specifications for No. 2–D S500 or No. 2–D S15 in ASTM D 975 (incorporated by reference in § 86.1), as required in the calendar year that in-use testing occurs.

(2) You may use any biodiesel fuel blend that is either expressly allowed or not otherwise indicated as an unacceptable fuel in the vehicle's owner or operator manual or in the engine manufacturer's published fuel recommendations.

(3) You may drain a prospective test vehicle's fuel tank(s) and refill the tank(s) with diesel fuel conforming to ASTM D 975 specifications described in paragraph (c)(1) of this section.

(4) Any fuel that is added to the fuel tank(s) of a prospective test vehicle, or during an in-use test, must be purchased at a local retail establishment near the site of vehicle procurement or screening, or along the test route. Alternatively, the fuel may be drawn from a central fueling source, provided that the fuel used is representative of that which is commercially available in the area where the vehicle is operated.

(5) No post-refinery fuel additives are allowed, except that one or more specific fuel additives may be used during in-use testing if you can document that the owner/operator of the prospective test vehicle has a history of normally using the fuel treatment(s), and the fuel additive(s) is not prohibited in the vehicle's owner or operator manual or in the engine manufacturer's published fuel-additive recommendations.

(6) You may take fuel samples from test vehicles to ensure that appropriate fuels were used during in-use testing. If a vehicle fails the vehicle-pass criteria and you can show that an inappropriate fuel was used during the failed test, that particular test may be voided. You may drain the vehicle's fuel tank(s) and refill the tank(s) with diesel fuel conforming to the ASTM D 975 specifications described in paragraph (c)(1) of this section. You must report any fuel tests that are the basis of voiding a test in your report under § 86.1920.

(d) You must test the selected engines while they remain installed in the vehicle. Use portable emission-sampling equipment and field-testing procedures referenced in § 86.1375. Measure emissions of THC, NMHC (by any method specified in 40 CFR part 1065, subpart J), CO, $NO_X$, PM (as appropriate), $O_2$, and $CO_2$.

(e) For Phase 1 testing, you must test the engine under conditions reasonably expected to be encountered during normal vehicle operation and use consistent with the general NTE requirements described in § 86.1370–2007(a). For the purposes of this subpart, normal operation and use would generally include consideration of the vehicle's normal routes and loads (including auxiliary loads such as air conditioning in the cab), normal ambient conditions, and the normal driver.

(f) For Phase 2 testing, we may give specific directions, as described in § 86.1915(c)(2).

(g) Once an engine is set up for testing, test the engine for at least one shift-day. To complete a shift-day's worth of testing, start sampling at the beginning of a shift and continue sampling for the whole shift, subject to the calibration requirements of the portable emissions measurement systems. A shift-day is the period of a normal workday for an individual employee. If the first shift-day of testing does not involve at least 3 hours of accumulated non-idle operation, repeat the testing for a second shift-day. If the second shift-day of testing also does not result in at least 3 hours of accumulated non-idle operation, you may choose whether or not to continue testing with that vehicle. If after two shift-days you discontinue testing before accumulating 3 hours of non-idle operation on either day, evaluate the valid NTE samples as described in § 86.1912 and include the data in the reporting and record keeping requirements specified in §§ 86.1920 and 1925. Count the engine toward meeting your testing requirements under this subpart and use the data for deciding whether additional engines must be tested under the applicable Phase 1 or Phase 2 test plan.

(h) You have the option to test longer than the two shift-day period described in paragraph (g) of this section.

(i) You may count a vehicle as meeting the vehicle-pass criteria described in § 86.1912 if a shift day of testing or two-shift days of testing (with the requisite non-idle/idle operation time as in paragraph (g) of this section), or if the extended testing you elected under paragraph (h) of this section does not generate a single valid NTE sampling event, as described in § 86.1912(b). Count the engine towards meeting your testing requirements under this subpart.

(j) You may ask us to waive measurement of particular emissions if you can show that in-use testing for such emissions is not necessary.

**§ 86.1912 How do I determine whether an engine meets the vehicle-pass criteria?**

In general, the average emissions for each regulated pollutant must remain at or below the NTE threshold in paragraph (a) of this section for at least 90 percent of the valid NTE sampling events, as defined in paragraph (b) of this section. For 2007 through 2009 model year engines, the average emissions from every NTE sampling event must also remain below the NTE thresholds in paragraph (f)(2) of this section. Perform the following steps to determine whether an engine meets the vehicle-pass criteria:

(a) Determine the NTE threshold for each pollutant subject to an NTE standard by adding all three of the following terms and rounding the result to the same number of decimal places as the applicable NTE standard:

(1) The applicable NTE standard.

(2) The in-use compliance testing margin specified in § 86.007–11(h), if any.

(3) An accuracy margin for portable in-use equipment when testing is performed under the special provisions of § 86.1930, depending on the pollutant, as follows:

(i) NMHC: 0.17 grams per brake horsepower-hour.

(ii) CO: 0.60 grams per brake horsepower-hour.

(iii) $NO_X$: 0.50 grams per brake horsepower-hour.

(iv) PM: 0.10 grams per brake horsepower-hour.

(4) Accuracy margins for portable in-use equipment for testing not performed under the special provisions of § 86.1930, to be determined by rulemaking as indicated in § 86.1935.

(b) For the purposes of this subpart, a valid NTE sampling event consists of at least 30 seconds of continuous operation in the NTE control area. An NTE event begins when the engine starts to operate in the NTE control area and continues as long as engine operation remains in this area (see § 86.1370). When determining a valid NTE sampling event, exclude all engine operation in approved NTE limited testing regions under § 86.1370–2007(b)(6) and any approved NTE deficiencies under § 86.007–11(a)(4)(iv). Engine operation in the NTE control area of less than 30 contiguous seconds does not count as a valid NTE sampling event; operating periods of less than 30 seconds in the NTE control area, but outside of any allowed deficiency area or limited testing region, will not be added together to make a 30 second or longer event. Exclude any portion of a sampling event that would otherwise exceed the 5.0 percent limit for the time-weighted carve-out defined in § 86.1370–2007(b)(7). For EGR-equipped engines, exclude any operation that occurs during the cold-temperature operation defined by the equations in § 86.1370–2007(f)(1).

(c) Calculate the average emission level for each pollutant over each valid NTE sampling event as specified in 40 CFR part 1065, subpart G, using each NTE event as an individual test interval. This should include valid NTE events from all days of testing.

(d) Calculate a time-weighted vehicle-pass ratio ($R_{pass}$) for each pollutant. To do this, first sum the time from each valid NTE sampling event whose average emission level is at or below the NTE threshold for that pollutant, then divide this value by the sum of the engine operating time from all valid NTE events for that pollutant. Round the resulting vehicle-pass ratio to two decimal places.

(1) Calculate the time-weighted vehicle-pass ratio for each pollutant as follows:

$$R_{pass} = \frac{\sum_{m=1}^{n_{pass}} t}{\sum_{k=1}^{n_{total}} t}$$

Where:

$n_{pass}$ = the number of valid sampling events for which the average emission level is at or below the NTE threshold.

$n_{total}$ = the total number of valid NTE sampling events.

(2) For both the numerator and the denominator of the vehicle-pass ratio, use the smallest of the following values for determining the duration, t, of any NTE sampling event:

(i) The measured time in the NTE control area that is valid for an NTE sampling event.

(ii) 600 seconds.

(iii) 10 times the length of the shortest valid NTE sampling event for all testing with that engine.

(e) The following example illustrates how to select the duration of NTE sampling events for calculations, as described in paragraph (d) of this section:

| NTE sample | Duration of NTE sample (seconds) | Duration Limit Applied? | Duration used in calculations (seconds) |
|---|---|---|---|
| 1 | 45 | No | 45 |
| 2 | 168 | No | 168 |
| 3 | 605 | Yes. Use 10 times shortest valid NTE. | 450 |
| 4 | 490 | Yes. Use 10 times shortest valid NTE. | 450 |
| 5 | 65 | No | 65 |

(f) Engines meet the vehicle-pass criteria under this section if they meet both of the following criteria:

(1) The vehicle-pass ratio calculated according to paragraph (d) of this section must be at least 0.90 for each pollutant.

(2) For model year 2007 through 2009 engines, emission levels from every valid NTE sampling event must be less than 2.0 times the NTE thresholds calculated according to paragraph (a) of this section for all pollutants, except that engines certified to a $NO_X$ FEL at or below 0.50 g/bhp-hr may meet the vehicle-pass criteria for $NO_X$ if measured $NO_X$ emissions from every valid NTE sample are less than either 2.0 times the NTE threshold for $NO_X$ or 2.0 g/bhp-hr, whichever is greater.

**§ 86.1915 What are the requirements for Phase 1 and Phase 2 testing?**

For all selected engine families, you must do the following:

(a) To determine the number of engines you must test from each selected engine family under Phase 1 testing, use the following criteria:

(1) Start by measuring emissions from five engines using the procedures described in § 86.1375. If all five engines comply fully with the vehicle-pass criteria in § 86.1912 for all pollutants, you may stop testing. This completes your testing requirements under this subpart for the applicable calendar year for that engine family.

(2) If one of the engines tested under paragraph (a)(1) of this section fails to comply fully with the vehicle-pass criteria in § 86.1912 for one or more pollutants, test one more engine. If this additional engine complies fully with the vehicle-pass criteria in § 86.1912 for all pollutants, you may stop testing. This completes your testing requirements under this subpart for the applicable calendar year for that engine family.

(3) If your testing results under paragraphs (a)(1) and (2) of this section do not satisfy the criteria for completing your testing requirements under those paragraphs for all pollutants, test four additional engines so you have tested a total of ten engines.

(4) An engine that fails to fully comply with the vehicle-pass criteria in § 86.1912 for any pollutant does not comply with the vehicle-pass criteria in § 86.1912 for the purposes of determining the number of engines to test from each selected engine family under this paragraph.

(b) For situations where a total of ten engines must be tested under paragraph (a)(3) of this section, the results of Phase 1 testing lead to the following outcomes:

(1) If at least eight of the ten engines comply fully with the vehicle-pass criteria in § 86.1912 for all pollutants, you may stop testing. This completes your testing requirements under this subpart for the applicable calendar year for that engine family.

(2) If six or seven vehicles from the Phase 1 sample of test vehicles comply fully with the vehicle-pass criteria in § 86.1912 for all pollutants, then you must engage in follow-up discussions with us to determine whether any further testing (including Phase 2 testing), data submissions, or other actions may be warranted.

(3) If fewer than six of the ten engines tested under paragraph (a) of this section comply fully with the vehicle-pass criteria in § 86.1912 for all pollutants, we may require you to initiate Phase 2 testing, as described in paragraph (c) of this section.

(4) You may under any circumstances elect to conduct Phase 2 testing following the completion of Phase 1 testing. All the provisions of paragraph (c) of this section apply to this Phase 2 testing.

(c) If you perform Phase 2 testing for any reason, test your engines as follows:

(1) You must test ten additional engines using the test procedures described in § 86.1375, unless we require you to test fewer vehicles.

(2) We may give you any of the following additional directions in selecting and testing engines:

(i) We may require you to select a certain subset of your engine family. This may include, for example, engines within a specific power range, engines used in particular applications, or engines installed in vehicles from a particular manufacturer.

(ii) We may direct you to test engines in a way that simulates the type of driving and ambient conditions associated with high emissions experienced during Phase 1 testing.

(iii) We may direct you to test engines in a specific state or any number of contiguous states.

(iv) We may direct you to select engines from the same sources used for previous testing, or from different sources.

(v) We may require that you complete your testing and reporting under Phase 2 within a certain period. This period may not be shorter than three months and must allow a reasonable amount of time to identify and test enough vehicles. We would generally expect this testing to be completed within the overall time period specified in § 86.1905(d).

**§ 86.1917 How does in-use testing under this subpart relate to the emission-related warranty in Section 207(a)(1) of the Clean Air Act?**

(a) An exceedance of the NTE found through the in-use testing program under this subpart is not by itself sufficient to show a breach of warranty under Clean Air Act section 207(a)(1) (42 U.S.C. 7541(a)(1)). A breach of warranty would also require one of the following things:

(1) That, at the time of sale, the engine or vehicle was designed, built, and equipped in a manner that does not conform in all material respects reasonably related to emission controls to the engine as described in the application for certification and covered by the certificate; or

(2) A defect in materials or workmanship of a component causes the vehicle or engine to fail to conform to the applicable regulations for its useful life.

(b) To the extent that in-use NTE testing does not reveal such a material deficiency at the time of sale in the design or manufacture of an engine compared with the certified engine, or a defect in the materials and workmanship of a component or part, test results showing an exceedance of the NTE by itself would not show a breach of the warranty under 42 U.S.C. 7541(a)(1).

**§ 86.1920 What in-use testing information must I report to EPA?**

(a) Send us electronic reports at *inuse@epa.gov* using an approved information format. If you want to use a different format, send us a written request with justification.

(b) Within 30 days after the end of each calendar quarter, send us reports containing the test data from each engine for which testing was completed during the calendar quarter. Alternatively, you may separately send us the test data within 30 days after you complete testing for an engine. Once you send us information under this section, you need not send that information again in later reports. Prepare your test reports as follows:

(1) For each engine family, describe how you recruited vehicles. Describe how you used any criteria or thresholds to narrow your search or to screen individual vehicles.

(2) Include a summary of the candidate vehicles you have rejected and the reasons you rejected them, whether you base the rejection on the criteria in § 86.1908(a) or anything else. If you rejected a candidate vehicle due to misfueling, included the results of any fuel sample tests.

(3) For the test vehicle, include the following background information:

(i) The EPA engine-family designation, and the engine's model number, total displacement, and power rating.

(ii) The applicable test phase (Phase 1 or Phase 2).

(iii) The date EPA selected the engine family for testing.

(iv) The vehicle's make and model and the year it was built.

(v) The vehicle identification number and engine serial number.

(vi) The vehicle's type or application (such as delivery, line haul, or dump truck). Also, identify the type of trailer, if applicable.

(vii) The vehicle's maintenance and use history.

(viii) The known status history of the vehicle's OBD system and any actions the owner or operator took to address OBD trouble codes or MIL illumination over the vehicle's lifetime.

(ix) Any OBD codes or MIL illumination that occur after you accept the vehicle for in-use testing under this subpart.

(x) Any steps you take to maintain, adjust, modify, or repair the vehicle or its engine to prepare for or continue testing, including actions to address OBD trouble codes or MIL illumination. Include any steps you took to drain and refill the vehicle's fuel tank(s) to correct misfueling, and the results of any fuel test conducted to identify misfueling.

(4) For each test, include the following data and measurements:

(i) The date and time of testing, and the test number.

(ii) Shift-days of testing (*see* § 86.1910 (g)), duration of testing, and the total hours of non-idle operation.

(iii) Route and location of testing. You may base this description on the output from a global-positioning system.

(iv) The steps you took to ensure that vehicle operation during testing was consistent with normal operation and use, as described in § 86.1910(e).

(v) Fuel test results, if fuel was tested under § 86.1908 or 86.1910.

(vi) The vehicle's mileage at the start of the test. Include the engine's total lifetime hours of operation, if available.

(vii) Ambient temperature, dewpoint, and atmospheric pressure at the start and finish of each valid NTE event.

(viii) The number of valid NTE events (*see* § 86.1912(b)).

(ix) Average emissions for each pollutant over each valid NTE event. Describe the method you used to determine NMHC as specified in 40 CFR

part 1065, subpart J. See Appendix I of this subpart for an example of graphically summarizing NTE emission results.

(x) Exhaust-flow measurements.

(xi) Vehicle-pass ratios (*see* § 86.1912(d)).

(xii) Recorded one-hertz test data, including, but not limited to, the following parameters:

(A) Ambient temperature.

(B) Ambient pressure.

(C) Ambient humidity.

(D) Altitude.

(E) Emissions of THC, NMHC, CO, $CO_2$ or $O_2$, $NO_X$, and PM (as appropriate). Report results for $CH_4$ if it was measured and used to determine NMHC.

(F) Differential back-pressure of any PEMS attachments to vehicle exhaust.

(G) Exhaust flow.

(H) Exhaust aftertreatment temperatures, if the engine meets the specifications of § 86.1370–2007(g).

(I) Engine speed.

(J) Engine brake torque.

(K) Engine coolant temperature.

(L) Intake manifold temperature.

(M) Intake manifold pressure.

(N) Throttle position.

(O) Any parameter sensed or controlled in order to modulate the emission-control system or fuel-injection timing.

(5) For each engine family, identify the applicable requirements, as follows:

(i) The applicable NTE thresholds.

(ii) Vehicle and engine information needed to identify the limited testing regions under § 86.1370–2007(b)(6) and (7).

(iii) Vehicle and engine information needed to identify any approved NTE deficiencies under § 86.007–11(a)(4)(iv).

(6) Include the following summary information after you complete testing with the engine:

(i) State whether the engine meets the vehicle-pass criteria in § 86.1912(f).

(ii) Identify how many engines you have tested from the applicable engine family and how many engines still need to be tested.

(iii) Identify how many engines from an engine family have passed the vehicle-pass criteria and the number that have failed the vehicle-pass criteria (see § 86.1912(f)).

(iv) If possible, state the outcome of Phase 1 testing for the engine family based on the criteria in § 86.1915(b).

(c) In your reports under this section, you must do all the following:

(1) Include results from all emission testing required under this subpart.

(2) Describe if any testing or evaluations were conducted to determine why a vehicle failed the vehicle-pass criteria in § 86.1912.

(3) Describe the purpose of any diagnostic procedures you conduct.

(4) Describe any instances in which the OBD system illuminated the MIL or set trouble codes. Also describe any approved actions taken to address the trouble codes or MIL.

(5) Describe any instances of misfueling, the approved actions taken to address the problem, and the results of any associated fuel sample testing.

(6) Describe any incomplete or invalid tests that were conducted under this subpart.

(d) Send us an electronic notification at *inuse@epa.gov* describing any voluntary vehicle/engine emission evaluation testing you intend to conduct with portable in-use measurement systems on the same engine families that are being tested under this subpart, from the time that engine family was selected for in-use testing under § 86.1905 until the final results of all testing for that engine family are reported to us under this section.

(e) Send us an electronic notification at *application-ci_cert@epa.gov* within 15 days after your initial review of the test data for a selected engine family indicates that three engines in Phase 1 testing have failed to comply with the vehicle-pass criteria. Similarly, send us an electronic notification at the above electronic address within 3 days after your initial review of the test data for a selected engine family indicates that *any* engine in Phase 2 testing failed to comply with the vehicle-pass criteria.

(f) We may ask you to send us less information in your reports than we specify in this section.

(g) We may require you to send us more information to evaluate whether your engine family meets the requirements of this part, or to help inform potential decisions concerning Phase 2 testing under § 86.1915.

**§ 86.1925 What records must I keep?**

(a) Organize and maintain your records as described in this section. We may review your records at any time, so it is important to keep required information readily available.

(b) Keep the following paper or electronic records of your in-use testing for five years after you complete all the testing required for an engine family:

(1) Keep a copy of the reports described in § 86.1920.

(2) Keep any additional records, including forms you create, related to any of the following:

(i) The procurement and vehicle-selection process described in § 86.1908, including the vehicle owner's name, address, phone number, and e-mail address.

(ii) Pre-test maintenance and adjustments to the engine performed under § 86.1910.

(iii) Test results for all void, incomplete, and voluntary testing described in § 86.1920.

(iv) Evaluations to determine why a vehicle failed the vehicle-pass criteria described in § 86.1912.

(3) Keep a copy of the relevant calibration results required by 40 CFR part 1065.

**§ 86.1930 What special provisions apply from 2005 through 2007?**

We may direct you to test engines under this subpart for emissions other than PM in 2005 and 2006, and for PM emissions in 2006 and 2007. In these interim periods, all the provisions of this subpart apply, with the following exceptions:

(a) We will select engine families for testing of emissions other than PM only when the manufacturer's Statement of Compliance specifically describes the family as being designed to comply with NTE requirements.

(b) If you participate in the test program described in § 86.1935(a), you may limit your testing under Phase 1 to a maximum of five vehicles per selected engine family.

(c) We will not direct you to do the Phase 2 testing in § 86.1915(c), regardless of measured emission levels.

(d) For purposes of calculating the NTE thresholds under § 86.1912(a) for any 2006 and earlier model year engine that is not subject to the emission standards in § 86.007–11, determine the applicable NTE standards as follows:

(1) If any numerical NTE requirements specified in the terms of any consent decree apply to the engine family, use those values as the NTE standards for testing under this subpart.

(2) If a numerical NTE requirement is not specified in a consent decree for the engine family, the NTE standards are 1.25 times the applicable FELs or the applicable emission standards specified in § 86.004–11(a)(1) or § 86.098–11(a)(1).

(e) In the report required in § 86.1920(b), you must submit the deficiencies and limited testing region reports (see § 86.007–11(a)(4)(iv) and § 86.1370–2007(b)(6) and (7)) for 2006 and earlier model year engines tested under this section.

(f) Testing under this section may be extended as described in § 86.1935(d).

**§ 86.1935 What special provisions may apply as a consequence of a delay in the accuracy margin report for portable emission measurement systems?**

(a) A memorandum entitled, ''Memorandum of Agreement, Program

to Develop Emission Measurement Accuracy Margins for Heavy-Duty In-Use Testing'' describes a test program for establishing measurement accuracy margins related to testing under § 86.1912(a)(4). This document is available at *http://www.epa.gov/otaq/hd-hwy.htm* or at the mailing address specified in § 86.1905(g).

(b) If there is a delay in receiving the written final report for either gaseous emissions or PM emissions described in the agreement referenced in paragraph (a) of this section, and that delay is not attributable to engine manufacturers failing to meet their commitments under that agreement, the following provisions apply for the respective pollutant type (gaseous or PM emissions):

(1) If the delay is 3 months or less, we will delay the designation of engine families for testing in the applicable calendar year, as described in § 86.1905(d), by the same number of additional whole months (rounded up) needed to complete the report.

(2) If the delay is more than 3 months but less than 12 months, we may continue to designate engine families for testing under the special provisions described in § 86.1930 for an additional year.

(3) If the delay is longer than 12 months, the following approach is established for the applicable calendar year:

(i) If the delay is longer than 12 months but less than 15 months, we will follow the steps described in paragraph (b)(1) of this section.

(ii) If the delay is longer than 15 months but less than 24 months, we will follow the steps described in paragraph (b)(2) of this section for the applicable calendar year.

(iii) If the delay is longer than 24 months, the applicable gaseous or PM emission testing program will go into abeyance.

(c) If one or more engine manufacturers fail to meet commitments under the agreement described in paragraph (a) of this section and such a failure results in a delay in the final written report for either gaseous emissions ($NO_X$, NMHC and CO) or PM emissions described in the agreement, the following provisions apply for the respective pollutant type (gaseous or PM emissions):

(1) If the delay is 3 months or less, we will delay the designation of engine families for testing in the applicable calendar year, as described in § 86.1905(d), by the same number of additional whole months (rounded up) needed to complete the report.

(2) If the delay is more than 3 months but less than 12 months, the provisions of this subpart will not apply for the otherwise applicable calendar year (2007 for gaseous emissions and 2008 for PM emissions), subject to the following provisions:

(i) We may identify the number of engine families that would otherwise have been designated for testing in that calendar year for the delayed pollutant type and direct manufacturers to test that number of engine families under the special provisions described in § 86.1930 and additionally in any later calendar year once the provisions of this subpart begin for that pollutant type, without counting those accumulated engine families toward the allowable annual cap on the number of engine families specified in § 86.1905.

(ii) A delay for PM emissions would not be a sufficient basis for delaying the program for gaseous emissions. Similarly, a delay for gaseous emissions would not be a sufficient basis for delaying the program for PM emissions.

(iii) The normal 18-month period for testing and reporting results specified in § 86.1905(d) is extended to 24 months for any accumulated engine-family designation described in paragraph (c)(2)(i) of this section. The additional time extensions for testing and reporting results as specified in § 86.1905(d) also apply.

(3) If the delay is longer than 12 months, the following approach is established for the applicable calendar year:

(i) If the delay is longer than 12 months but less than 15 months, we will follow the steps described in paragraph (c)(1) of this section.

(ii) If the delay is longer than 15 months but less than 24 months, we will follow the steps described in paragraph (c)(2) of this section for the applicable calendar year.

(iii) If the delay is longer than 24 months, we will continue to follow the steps described in paragraphs (c)(1) and (c)(2) of this section, including the accumulation of engine families for testing, until the report is received and the fully implemented program commences.

(d) We may determine that any individual manufacturer's failure under paragraph (c) of this section constitutes a failure by all engine manufacturers.

(e) Nothing in this section affects our ability to select engines from any model year beginning with model year 2007.

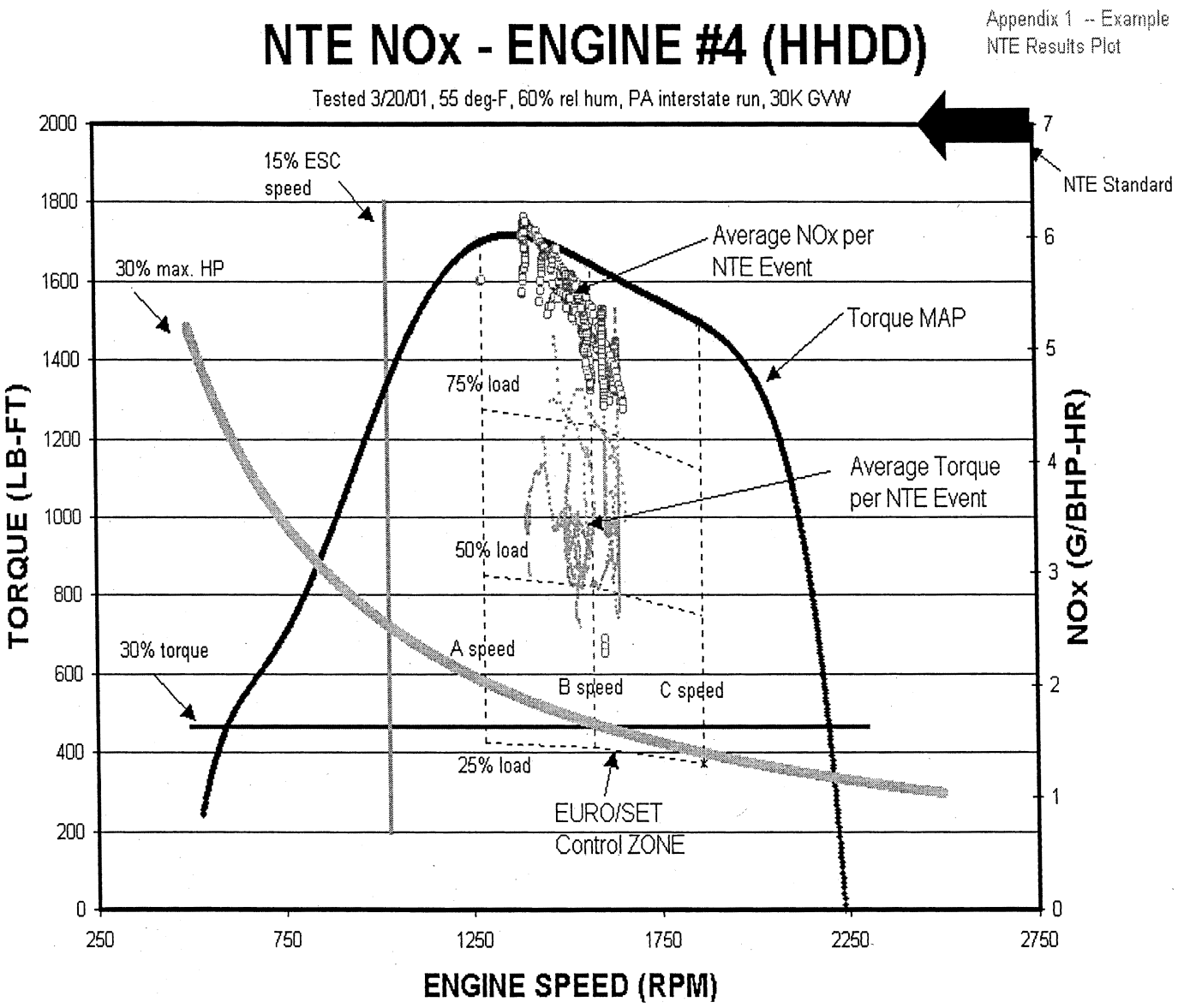
(f) If we determine that fundamental technical problems with portable in-use PM measurement systems are not resolvable in a reasonable time, the provisions of this subpart, as they apply to PM, will go into abeyance until we determine that suitable emission-measurement devices are available for in-use testing.

(g) As described in § 86.1930(b), engine manufacturers contributing to the test programs described in the agreement referenced in paragraph (a) of this section may limit their testing under the special provisions described in § 86.1930 to five engines in each selected engine family.

**Appendix I to Subpart T—Sample Graphical Summary of NTE Emission Results**

The following figure shows an example of a graphical summary of NTE emission results:

Appendix 1 -- Example NTE Results Plot

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