NESCAUM
Northeast States for Coordinated Air Use Management

Connecticut Bureau of Air Management, Carmine DiBattista
Maine Bureau of Air Quality Control, James Brooks
Massachusetts Division of Air Quality Control, Nancy Seidman
New Hampshire Air Resources Division, Kenneth Colburn
New Jersey Office of Air Quality Management, John Elston
New York Division of Air Resources, Robert Warland
Rhode Island Office of Air Resources, Stephen Majkut
Vermont Air Pollution Control Division, Richard Valentinetti

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United States Environmental Protection Agency
Office of Air and Radiation
Docket and Information Center, Room M
Mail Code 6102
Docket No. A-98-32
401 M. Street, S.W.
Washington, D.C. 20460

Re: Control of Emissions of Air Pollution from 2004 and Later Model Year Heavy-Duty Highway Engines and Vehicles; Revision of Light-duty Truck Definition

Dear EPA Docket:

The Northeast States for Coordinated Air Use Management (NESCAUM) is pleased to provide comments on the Environmental Protection Agency's (EPA) *Control of Emissions of Air Pollution from 2004 and Later Model Year Heavy-Duty Highway Engines and Vehicles; Revision of Light-duty Truck Definition* (NPRM). The NESCAUM states support EPA's proposal to reduce emissions from 2004 and later model year highway diesel and gasoline engines and vehicles. We ask that EPA consider the following comments on this NPRM.

Background

The control of emissions from heavy-duty engines used in highway applications has been identified as a priority by the Northeast states because these sources are significant contributors to elevated levels of ozone, fine particulate matter, and toxic air contaminants in our region. Heavy-duty vehicles also contribute to acid deposition, nitrofication of marine water bodies and regional haze all of which are high priority environmental issues in the Northeast. Given the limited authority individual states have

Jason S. Grumet, Executive Director
129 Portland Street
Boston, Massachusetts 02114
Phone (617) 367-8540
Fax (617) 742-9162
www.nescaum.org

to regulate heavy-duty engines, this federal initiative is critical to the ability of states to demonstrate long-tern attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) for these pollutants. Further, diesel particles are classified by EPA as probable human carcinogens and the California Air Resources Board has labeled diesel particulate a toxic air contaminant.

In the Northeast, NOx controls represent a vital component of the overall strategy to bring all areas of our region into compliance with the ozone standard. Emission inventories indicate that heavy-duty engines (highway and nonroad) were responsible for about 33% of the NOx generated in the region in 1990. This is approximately equivalent to the inventory contribution from light-duty vehicles and from electric utilities. The introduction of the 8-hour ozone and PM fine standards will necessitate further reductions to attain the NAAQS.

Current emissions inventories assume that heavy-duty engines are in compliance with the emission standards for NOx. Given that class 8 heavy-duty engines manufactured between 1988 and 1998 emit NOx at up to three times the standard, the contribution from heavy-duty engines in the region is greater than previously projected and thus must be reduced to a greater degree. Figures 1 and 2 below show the contribution of diesels to the total NOx inventory assuming: 1) that engines emit at the standard and 2) that engines emit at levels found during in-use testing. When excess NOx emissions are taken into account the total contribution from large trucks and diesels grows to over 20% of the total NOx inventory.[1]

Figure 1: Assumes compliance with NOx certification standards

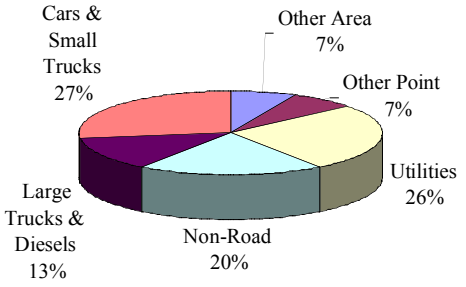
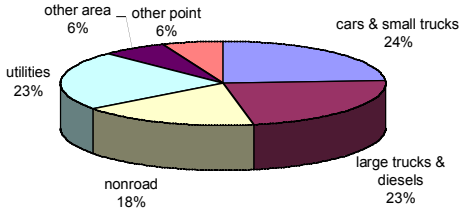


Figure 2: Assumes non-compliance

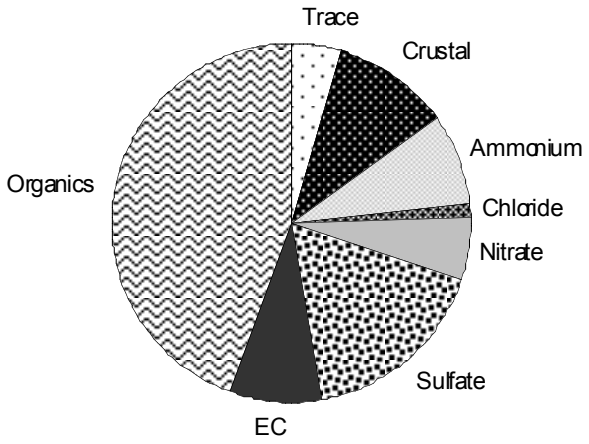


The particulate matter emitted by heavy-duty engines also contribute to a significant public health threat in urban areas throughout the Northeast. An analysis of fine particulate data from Kenmore Square in Boston suggest that mobile sources contribute the majority of direct and indirect particulate matter at the monitoring site. Given the

[1] Source: OTAG data. HDD NOx emissions were estimated based on total excess NOx emissions for 1998 and HDV registration data in the Northeast states.

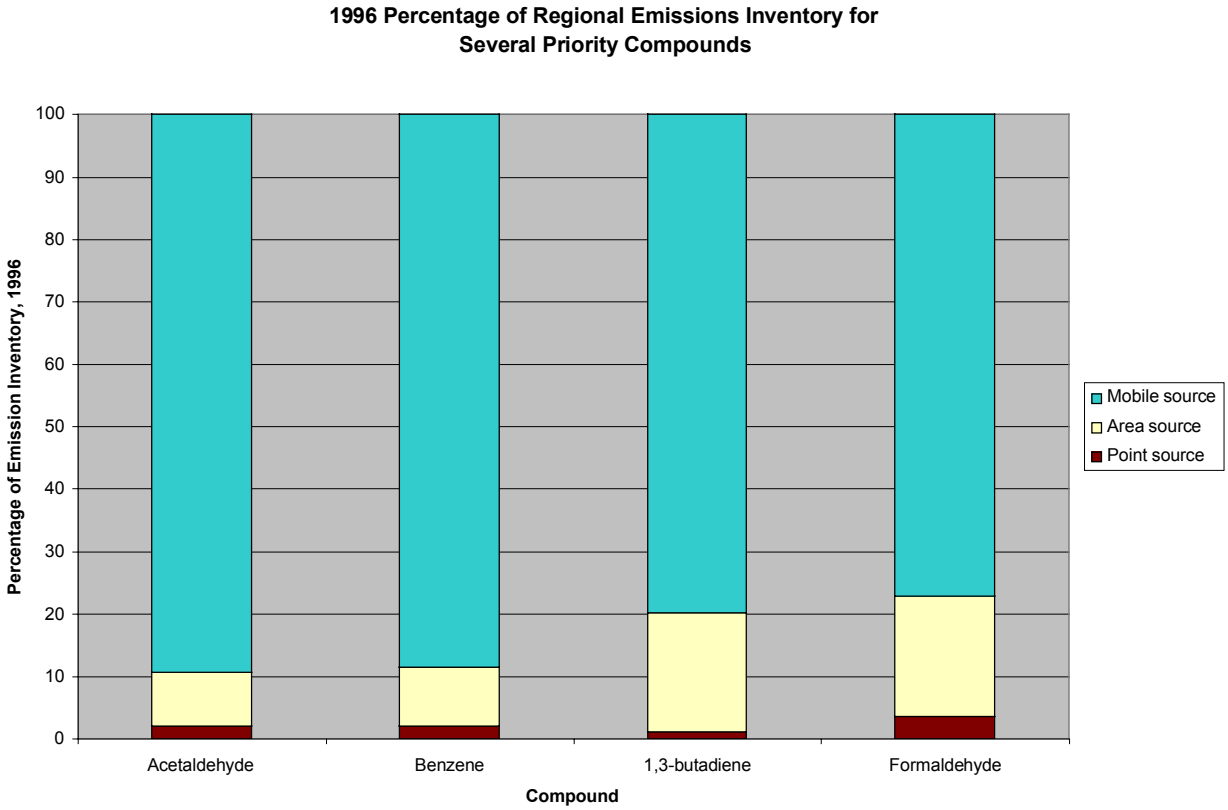
population density at this and other urban locations where diesel emissions are high, and the substantial epidemiological evidence of the very serious health risks associated with exposure to fine particulate matter, the NESCAUM states believe that the most stringent feasible particulate certification standards be sought in this rulemaking.

Figure 3: Kenmore Sq. Fine Particle Composition



As a result of the visible smoke emitted by trucks and buses and the common perception that existing emission standards for trucks and buses are lenient relative to those imposed on personal passenger cars, there is significant public support within our region for further controlling emissions from heavy-duty engines. This is evidenced by the signing in June of this year of a nine-state memorandum of understanding to develop heavy-duty smoke inspection and maintenance programs for highway diesels by the year 2001.

In addition to NOx and PM, diesels emit over 40 known carcinogens and many other toxic substances with non-cancer health effects. As is seen in Figure 4, mobile sources contribute 75% to 90% of the inventories of benzene, formaldehyde, acrolein, and 1-3 butadiene in the Northeast (1996 NTI data). These four compounds are the major risk drivers of toxic compounds found in ambient air. Ambient monitoring of these compounds shows that state and federal health benchmarks are exceeded in all the Northeast states. Reducing diesel and gasoline engine toxic emissions will be a key factor in reducing overall risk associated with toxic emissions.



Given the need for heavy-duty engine emissions reductions, NESCAUM applauds the efforts of the USEPA in developing the proposed rule for 2004 and later model year diesel and gasoline vehicles and engines. While the proposed rule provides a reasonable basis for many aspects of the future heavy-duty highway engine and vehicle program, the Northeast states believe the proposed rule should be strengthened in a number of ways. The following are some specific suggestions we think will improve the rule, along with an explanation as to why we think the proposed changes are necessary from an air quality perspective.

Heavy-Duty Diesel Engines and Vehicles

NESCAUM strongly concurs with EPA's position that significant further NOx reductions will be necessary both inside and outside of existing non-attainment areas to reduce transported pollution and to allow for timely attainment of the ozone standard. Indeed, the need for further NOx controls to effectively reduce ozone levels, especially in the eastern U.S. is well established and widely accepted.

NESCAUM recognizes that localized ozone disbenefits associated with reduced NOx emissions do occur in some urban centers. Given the limited geographic scope of this phenomenon and the mobile nature of heavy-duty engines used in highway applications,

however, the benefits associated with reducing NOx from this source far outweigh such disbenefits on a national scale. OTAG modeling results support this notion.

Stringency of Proposed NOx Standard

The Northeast states support the proposed NMHC + NOx standard of 2.4 g/bhp-hr as being an appropriate and cost effective control measure for the 2004 timeframe. The technologies that will be used to comply with the 2004 standard will likely be a combination of advanced fuel injection, EGR, advanced turbocharger systems, and advanced electronic controls. EGR reduces NOx by 90% at light load and 60% at full load. Some of these systems have already begun to be introduced by manufacturers. For example, second generation electronically controlled fuel injection systems have been introduced. The proposed standards will not require the use of exhaust aftertreatment. The technical feasibility of the 2.4 g/bhp-hr NMHC + NOx standard was confirmed by the decision of heavy-duty engine manufacturers to introduce the 2.4 g/bhp-hr standard in 2002 as part of the heavy-duty engine consent decrees.

The per vehicle cost of achieving the 2004 NOx + NMHC standard for heavy heavy-duty diesels is estimated by EPA to be approximately $800. At an average vehicle cost of $96,400, attaining the standard will result in less than a 1% increase in the cost of a heavy heavy-duty diesel vehicle. The cost per ton of NOx reduced is estimated to be approximately $550 per vehicle (average for all heavy-duty diesel vehicles) and $350 to $400 per ton of NOx + NMHC reduced, making this among the most cost effective control measures available for NOx.

Fuel Changes Needed to Meet the Proposed NOx + NMHC Standard

NESCAUM concurs with EPA that no fuel changes need to be made in order for engine manufacturers to comply with the 2004 standard for NOx + NMHC. The use of cooled EGR with current highway diesel fuel (comprised of .05% sulfur by weight) can result in the formation of sulfuric acid (H_2SO_4). The acid has a corrosive effect on engines. This problem can be overcome with the introduction of corrosive resistant metals such as stainless steel. In addition, design changes to the EGR cooler will reduce the formation of sulfuric acid in the EGR system. Since the 2.4 g/bhp-hr NOx +NMHC standard can be met without the use of exhaust aftertreatment systems such as NOx adsorbers which are sulfur intolerant, there is no need to change the composition of diesel fuel in order for engine manufacturers to meet the proposed NOx + NMHC standard for 2004. At the same time, EPA should not lose sight of the need for an in-use monitoring program to ensure durability of EGR systems over time.

While the NESCAUM states do not believe that low sulfur fuel is needed in order for engine manufacturers to comply with the 2.4 g/bhp-hr NOx standard, we strongly support the introduction of low sulfur fuel. Low sulfur diesel fuel will enable aftertreatment devices which can substantially reduce heavy-duty engine NOx and PM emissions. In addition, low sulfur fuel will reduce sulfate emissions from existing engines.

<u>Proposed Particulate Standard</u>

From a public health standpoint, airborne particles, especially fine particles under 10 microns in diameter, are among the most harmful forms of air pollution. As noted in the NPRM, particulate pollution has been consistently linked with a range of serious adverse health impacts, including morbidity and premature mortality, in a large number of epidemiological studies. The proposed new annual and 24-hour standards specifically target fine particles ($PM_{2.5}$) and were based on an exhaustive analysis of the available health evidence.

The proposal does not address primary particulate emissions from heavy-duty engines. This is the case even though the NPRM states that "reports on source apportionment …indicate that the contribution of diesel engines to PM inventories in several local areas around the U.S. are much higher than what would be assumed from looking only at the estimates presented in national PM inventories." This corresponds to data indicating that in the East upwards of 65% of PM fine mass is composed of not crustal and miscellaneous materials which dominate the PM inventory in the West, but by the primary and secondary products of combustion and other anthropogenic sources. Chief constituents of fine particles include elemental and organic carbon, ammonium, sulfates, and nitrates. This is seen in figure 3 where Kenmore Square $PM_{2.5}$ data shows that products of combustion most likely contribute the majority of fine particles monitored at this urban Boston location.

The NESCAUM states believe that a more stringent PM certification standard of .05 can be met with current diesel fuel and with commercially available exhaust aftertreatment devices such as oxidation catalysts. Urban buses have met a .05 g/bhp-hr PM standard since 1996 largely with the use of oxidation catalysts. Epidemiological studies suggest that there is no threshold below which the public is safe from exposure to fine particles. Consequently, NESCAUM believes that this rulemaking should target lower particulate emissions regardless of the current uncertainty with regard to the magnitude of future nonattainment for a fine particle standard. In addition, EPA should ensure that new technology engines do not cause an increase in particle number or a decrease in overall particle size at the same time that PM mass is reduced. Requiring traps that reduce ultra fine particles will ensure that as mass PM emissions are reduced to attain the NAAQS, public health is not jeopardized by increases in the number of fine particles.

Supplemental Exhaust Emissions Standards and Test Procedures for HD Diesel Engines

The NESCAUM states strongly support the addition of a steady state test cycle, the not to exceed standard, and the diesel supplemental load response test to the current Federal test procedures for HD diesel engines. The proposed steady-state test cycle is consistent with the test cycle found in the European "EURO III ESC Test" and mimics engine conditions found in over-the-road driving conditions. EURO III test cycle exhaust temperatures, rpm, and torque are more representative of long haul driving operations than are the engine conditions over the current FTP. The EURO III steady state modes typically result in greater NOx emissions than the FTP. These higher NOx emissions will now be captured in the test procedure for heavy-duty diesel engines. In addition to the EURO III steady state test cycle, NESCAUM is strongly supportive of the addition to the test of three additional "peak" points to ensure that engine emissions do not peak outside of the 13-mode test points.

Not to Exceed Standard

The NESCAUM states strongly support the development of the Not To Exceed Standard "NTE." The NTE will facilitate in-use testing and allows for certification testing over a broad range of engine conditions typical during normal driving. As stated in EPA's NPRM, the goal in establishing the NTE was to ensure emission control over a wide range of in-use conditions, including ambient temperature and humidity. EPA has proposed to include emissions data corrected for humidity and temperature when temperatures and humidity ranges are outside of the proposed ranges for laboratory testing. This aspect of the proposed program will allow for the inclusion of emissions testing data over a broad range of climate conditions. The proposed temperature range will be from 55 to 95 degrees Fahrenheit. This temperature range is exceeded for a substantial portion of the year in many Northeast states. Thus, in providing for temperature and humidity corrections, EPA is allowing in-use testing to take place at any time of the year, during conditions that are typical for the region. The inclusion of these emissions data corrected for humidity and temperature will allow for the full benefits of the NTE standard to be realized.

Access to ECM Data

EPA proposes to require engine manufacturers to provide AECD data. This element is extremely important for state in-use testing programs. Converting mass emissions data to g/bhp-hr is not possible without torque information available from the electronic control module ("ECM").

Diesel Vehicle Chassis Certification Program

EPA does not propose to require diesel vehicles under 14,000 lbs GVWR to be chassis certified. The NESCAUM states strongly urge EPA to require complete diesel heavy-duty vehicles under 14,000 lbs GVWR to be subject to chassis-based standards. Introducing a requirement for chassis-based standards for heavy-duty diesels under 14,000 lbs will enable the development of fuel neutral emissions standards for these heavy-duty vehicles; will eliminate the need for conversion of emission factors from g/mi to g/bhp-hr; and will establish emissions data in g/mi that will enable states, EPA, and manufacturers to conduct in-use emissions testing to verify emissions compliance. As EPA moves ahead to establish a manufacturer-based in-use testing program, chassis based certification will reduce the cost and inconvenience associated with in-use testing of engine certified vehicles. Moreover, as states develop heavy-duty vehicle inspection and maintenance programs, these programs will be greatly simplified by chassis dynamometer testing. Engine dynamometer testing is virtually impossible, given the cost and down time associated with the testing procedure.

In the proposal EPA requested comments on whether or not diesel vehicles under 14,000 lbs should be held to the same standards as gasoline vehicles under 14,000 lbs. The Northeast states believe that diesel vehicles under 14,0000 lbs should be held to a standard that is as close as technically feasible to the gasoline standard. Since EGR can reduce NOx by 90% at light load and 60% at full load it may be possible for diesel vehicles to be held to the same standards as gasoline vehicles. If not, then the Northeast

states recommend that the current g/bhp-hr standard be converted to g/mi for the purpose of developing a chassis certification standard. In either case, NESCAUM urges EPA to require that heavy-duty diesel vehicles under 14,000 lbs. be certified to the California MDV PM standard of .12 g/mi.

Otto Cycle Complete Vehicle and Engine Standards

The NESCAUM states are strongly supportive of the proposed new engine and vehicle emissions standards for heavy-duty Otto cycle vehicles and engines. NESCAUM is also supportive of efforts to harmonize elements of the California Otto cycle vehicle program with the federal program. We have some suggestions on EPA's proposal which are summarized below.

Otto cycle engine standards

NESCAUM strongly supports the proposed 1 g/bhp-hr NOx + NMHC standard for incomplete gasoline vehicles over 14,000 lbs GVWR. The standards will achieve a 75% reduction in NOx over current standards. We believe the proposed standards are technically feasible. A combination of improved EGR, leak free exhaust systems, 3-way catalyst improvements, and closed loop electronic control of the air fuel ratio will be used to reach the 1 g/bhp-hr NOx + NMHC standard. With the exception of a few technologies, many of these technologies are used in some heavy-duty and light-duty vehicles already in production.

Most likely, manufacturers will use a combination of improved 3-way catalysts and closed loop electronic control of the air fuel ratio to meet the standards. While the proposed standard poses technical challenges to engine manufacturers, technical advances in 3-way catalysts now allows for durable and effective emissions control at the high temperatures which can occur when heavy-duty gasoline engines are under full load.

At a cost of $287 per engine and approximately $475 per ton of NOx + NMHC reduced the standard represents a highly cost effective means of reducing NOx emissions.

Heavy-duty Otto cycle complete vehicle standards

The NESCAUM states applaud the adoption of the California LEV standards and test procedures for complete heavy-duty Otto cycle vehicles between 8,500 and 14,000 lbs GVWR. The harmonization of certification requirements will simplify the certification procedure for manufacturers and will facilitate the development and implementation of in-use compliance testing.

The standards are technically and economically feasible. Changes to precious metal loading on catalysts and other strategies are readily available and now provide greater reductions in NOx and NMHC. Many vehicles currently being certified in California have NOx emissions of between .3 and .5 g/mi which is well within the LEV standards proposed for heavy-duty Otto cycle complete vehicles up to 14,000 lbs. At a cost of $500 per ton of NOx + NMHC reduced the proposed standards are extremely cost effective.

NESCAUM urges EPA to consider adopting the more stringent LEV II standards for heavy-duty Otto cycle vehicles under 14,0000 lbs manufactured after 2007.

The NESCAUM states also strongly support the proposal to require heavy-duty Otto cycle vehicles under 14,000 to be certified to chassis-based standards. In addition we applaud EPA's requirement that heavy-duty Otto cycle vehicles be certified according to chassis based enhanced evaporative test procedures; the requirement that onboard refueling vapor recovery (ORVR) controls be used on vehicles up to 10,000 lbs; and the extension of CAP 2000 requirements to chassis certified heavy-duty vehicles. These elements of the proposal will reduce evaporative emissions from heavy-duty Otto cycle vehicles, and establish an in-use compliance program for Otto cycle vehicles under 14,000 lbs.

In addition, The NESCAUM states strongly support the establishment of OBD requirement for Otto cycle and diesel vehicles under 14,000 lbs. The proposed OBD requirements are similar to those already in place for light-duty trucks and vehicles under the federal program. The OBD requirements will provide many benefits including: 1) early warning of an emissions related problem; 2) facilitating this development of state, EPA, and manufacturer based in-use testing programs; 3) detection of problems associated with aftertreatment devices; and 4) detection of problems in the evaporative system controls. OBD systems, while not currently required on heavy-duty vehicles outside of California, have been installed on all heavy-duty vehicles certified in California. Manufacturers will be able to transfer the OBD technology from California certified vehicles to vehicles certified under the federal program.

The NESCAUM states urge EPA to establish catalyst and trap monitoring requirements for diesel vehicles. OBD for these add-on devices will address durability concerns and detect any emissions problems as soon as they arise.

Revised definition of light-duty truck

The NESCAUM states support the proposed revision of the light-duty truck definition to include passenger vehicles up to 10,000 lbs GVWR. Many full size pick-up trucks, vans, and sport utility vehicles are used for personal transportation. These vehicles should be certified as passenger vehicles and be subject to the more stringent Tier 2 standards for light duty trucks. According to EPA certification data, a large number of gasoline engine families between 8,500 and 10,000 lbs are already capable of meeting the highest bin under the Tier 2 interim program (.6 g/mi). The current language in the proposal limits the revised definition of light-duty truck to those vehicles that carry up to 12 passengers. The NESCAUM states urge EPA to regulate all passenger vehicles from 8,500 to 10,000 lbs. as light duty trucks regardless of how many passengers the vehicles can carry. This is necessary since some SUVs and vans can carry more than 12 passengers.

In-use testing program and OBD for >14,000 lb. vehicles

NESCAUM is concerned that the NPRM overestimates real world benefits of the proposed new standards due to the lack of a federal heavy-duty engine in-use enforcement program. Actual in-use emissions are greater than model estimates based on

certification data suggest for the following reasons: 1) normal deterioration of engine and emission control components are not accurately accounted for in the MOBILE model which assumes these engines meet the certification standards in-use; and 2) the effects of malmaintenance and tampering are not adequately reflected in the model. Table 1 on the next page shows that combinations of typical malmaintenance problems can increase HC, PM, and NOx emissions 10 fold.[2] While these data were collected from engines with mechanically controlled fuel injection, similar excess emissions may occur in newer electronically controlled engines. Smoke testing programs in the Northeast have noted heavily smoking new electronically controlled diesel vehicles. This may indicate that PM, CO, HC and NOx emissions are also deteriorating from certification standards in these vehicles.

[2] Reproduced from a SWRI report for the Bureau of Mines entitled "Relationship of Underground Diesel Engine Maintenance to Emissions" Volume I, 1983

Effects of Faults and Maladjustments on Diesel Engine
Exhaust Composition: Arrows Indicate Change from Baseline

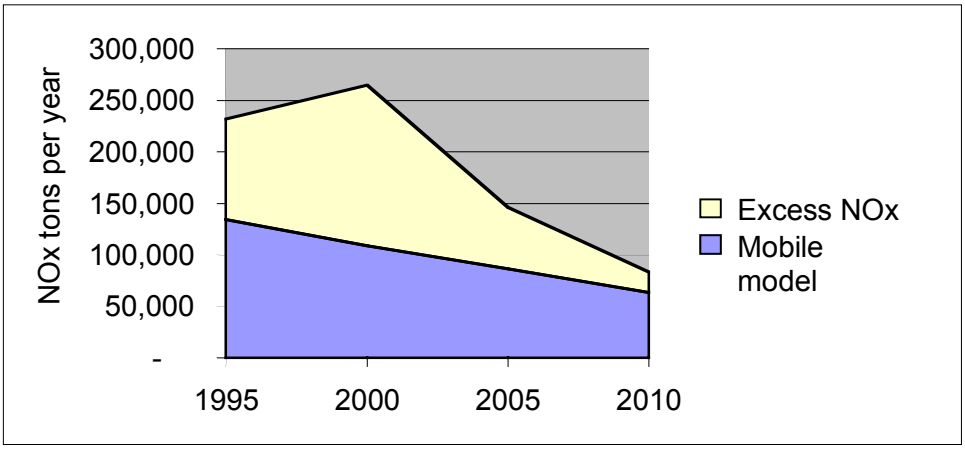
No.	Fault Description		HC	CO	NOx	PART.*
1-1	Intake Restriction (in - H_20)	25	→	→	→	→
1-2		50	→	→	→	↗
2-1	Exhaust Restriction (in - Hg)	3.0	→	→	→	→
2-2		6.0	→	→	→	→
3-1	Timing Advance (from Mfg. Spec.)	-4º	↑	↗	→	↑
3-2		+4º	↗	→	→	→
3-3		+8º	↗	→	↗	→
4-1	Overfueling (% rated)	10%	→	↗	→	↗
4-2		20%	→	↑	→	↗
5-1	Intake Restriction Timing Advance	25 -4º	↗	→	→	↗
5-2		50 -4º	↑	↗	→	↑
6-1	Exhaust Restriction Timing Advance	3.0 +4º	↗	→	→	→
6-2		6.0 +8º	→	→	↗	↗
7-1	Intake Restriction Overfueling	25 10%	→	↗	→	↗
7-2		50 20%	→	↑	→	↑
8-1	Overfueling Timing Advance	10% +4º	→	↗	→	↗
8-2		20% +8º	→	↗	→	↑
9-1	Intake Restriction Exhaust Restriction	25 3.0	→	→	→	→
9-2		50 6.0	→	↗	→	↗
10-1	Exhaust Restriction Overfueling	3.0 10%	→	↗	→	↑
10-2		6.0 20%	→	↑	→	↑
11-1	Int., Exh. Restric. Overfuel, Timing Adv.	25, 3.0 10%, +4º	→	↗	→	↑
11-2		50, 6.0 20%, +8º	→	↑	→	↑

*This represents particulate production at the most severe engine operating mode.

↑ Indicates >200% increase above baseline
↗ Indicates 50% to 200% increase
→ Indicates <50% increase

An important in-use testing element originally included in the EPA proposal was removed at the request of engine manufacturers. This element was a manufacturer based in-use testing program. The NESCAUM states strongly urge EPA to require this testing program in the 2004 timeframe. Engine manufacturers have ample time between now and 2004 to develop an in-use testing method. One in-use testing device, ROVER, has already been developed and has been shown to provide continuous emissions data within 10 percent accuracy. Establishing an in-use compliance program is imperative given recent data showing that class 8 engines are emitting NOx at three times the certification standard. Defeat devices used on 1988 to 1998 model year engines will result in over 15 million tons of excess NOx emissions in the U.S. In the Northeast this will more than double NOx emissions from heavy-duty trucks in the region until the problem is remedied. Figure 5 shows two scenarios of NOx emissions from heavy-duty vehicles in the Northeast. In the first scenario (dark colored area of graph), Mobile model assumptions are used. In the second scenario (light colored area of graph) the excess NOx emissions from class 8 trucks are included. The excess emissions begin to drop off in the year 2000 assuming rebuild kits will lower in-use NOx emissions. This example of excess emissions underscores the importance of establishing in-use enforcement programs to ensure compliance with the heavy-duty emissions certification standards.

Figure 5: Excess NOx Emissions from Heavy-Duty Diesel Engines in the Northeast



As stated in the NPRM "[the Agency] does not believe that relying on the current compliance program and the use of enforcement actions and relying on the use of enforcement actions in the future is the most appropriate method to assure in-use compliance of heavy-duty engines under all operating conditions. We estimate that the more than 1,000,000 engines at issue ...will have resulted in excess NOx emissions of more than 15 million tons over the lifetime of the engines...This level of NOx is enormous. To put this in perspective, the Agency's National Air Pollution Emission Trends report...estimates that the total U.S. emissions was 23.3 million tons...The 1.3 million tons excess NOx emissions from heavy-duty diesels in 1998 represent approximately 5% of the national total."

EPA should use this rulemaking to develop more effective programs for controlling excess emissions. The in-use program must both create an incentive for manufacturers to build more durable engines and provide a mechanism to ensure that high emitting engines are identified and repaired. In-use deterioration, which is likely to be even more

significant as emissions standards are tightened, can be minimized through the imposition of a more rigorous federal in-use enforcement program as well as a manufacturer based in- use testing program.

In addition to the in-use testing program, other elements were removed from the proposal including: 1) OBD for vehicles over 14,000 lbs; 2) supplemental test procedures for Otto cycle engines; and 3) a revised rated speed definition used in certification of heavy-duty engines. These elements are important to ensuring that heavy-duty engines meet emissions standards in use. The supplemental test procedures for Otto cycle engines are needed so that a more representative test cycle for heavy-duty gasoline engines is used for certification. Like light and medium-duty OBD, diagnostics for heavy-duty engines are needed in order to detect the malfunction of exhaust aftertreatment devices before they become gross emitters.

As was shown in Table 1, there is considerable evidence that malmaintenance and deliberate tampering are important concerns. Tampering of engines has been noted for both mechanically and electronically controlled engines during smoke testing at roadside. The adoption of OBD requirements for vehicles greater than 14,000 lbs would be an important first step toward improving maintenance practices and reducing deliberate tampering with components which affect emissions. If heavy-duty vehicles were equipped with comprehensive OBD systems, states would have greater options with regard to inspection and maintenance programs for these vehicles.

ABT Program

Although NESCAUM supports the theoretical concept of averaging, banking and trading (ABT), we are concerned about its historical application with regard to the heavy-duty engine certification program. Properly designed ABT programs provide: 1) design and production flexibility; 2) the opportunity to reduce the cost of compliance with air quality standards; 3) an incentive to design and produce advanced technologies to generate credits; and 4) a means to ensure full emission benefits. While we support these goals, the Northeast states are concerned that the lack of a viable in-use enforcement program has led to a situation whereby potential emission reductions from heavy-duty engine standards are actually jeopardized by the ABT program.

Our primary concern is that engine manufacturers have little incentive to set family emission limits (FELs) at the appropriate level, considering in-use deterioration, because there is no credible enforcement program to identify engine families which are not achieving certification levels in-use. Consequently, engine manufacturers have an incentive to "shave" their compliance margins and maximize banked credits. This issue can be quickly and properly resolved with a firm commitment by EPA to routinely test and enforce in-use emission standards.

We are concerned that specific changes EPA has proposed in the NPRM serve to further weaken the diesel ABT program by emphasizing flexibility for manufacturers without necessarily providing additional incentives for the introduction of clean engine technology. In particular, NESCAUM questions the wisdom of eliminating credit discounting or in extending the limited life credit provision beyond three years. The existing ABT program already provides manufacturers considerable flexibility to produce higher emitting engines which prove technically difficult or costly to bring into compliance with the certification standards. With regard to Otto cycle ABT credits,

NESCAUM urges the Agency to prohibit credit exchanges between the engine and whole vehicle programs. The engine program is designed to provide added flexibility to manufacturers while they adapt emission control technologies for heavy-duty engines. This flexibilily is not needed for the lighter trucks which are already meeting the LEV standards in California. In addition, NESCAUM supports the 2 g/bhp-hr cutoff for credit generation for incomplete vehicles and does not believe that a gradual decline is needed.

The NESCAUM states are concerned that flexibility provided in heavy-duty engine and vehicle certification through the ABT program could interfere with the development of effective state in-use inspection and maintenance programs. Specifically, we are concerned that the combined NOx + NMHC standard will make the establishment of in-use standards for NOx difficult. In addition, establishing cutpoints for heavy-duty I/M programs could be complicated by the certification of engines to many different standards through the ABT program. The heavy-duty ABT program should not in any way interfere with the development of state heavy-duty I/M programs.

Proposed Standards for 2007 and later model year engines

The NESCAUM states believe the proposed NOx and PM standards for model year 2007 engines are technically and economically feasible. The demonstration of NOx adsorbers and particulate traps in combination with low sulfur fuel show that the proposed standards are feasible. A recent testing program conducted by the Department of Energy and others showed adsorbers reduced NOx emissions by more than 90%. Similar work with PM traps in Europe and in the U.S. show PM reductions of over 90%. The NESCAUM states urge EPA to move forward aggressively with rulemakings on new diesel emissions standards and diesel fuel sulfur so that substantial NOx and PM reductions will be achieved for the 2007 model year.

Conclusion

NESCAUM applauds the effort and creativity that EPA put into developing the NPRM. The need for further NOx reductions across broad areas of the country is widely acknowledged. The 2.4 g/bhp-hr NOx + NMHC standard proposed in this rulemaking will provide significant NOx reductions. The 1 g/bhp-hr NOx + NMHC standard proposed for heavy-duty incomplete gasoline vehicles and the adoption of more stringent standards for complete Otto cycle vehicles (under 14,000 lbs) will also provide significant reductions in NOx and NMHC.

The Northeast states are disappointed that the NPRM does not propose a more stringent particulate standard. The adoption of the PM 2.5 NAAQS and the importance of heavy-duty engines as a source of fine PM must be reconciled and NESCAU M believes that it is short sighted of EPA to let this opportunity pass. The fact that diesel particles are a probable human carcinogen provides an additional rationale for tightening PM standards in this rulemaking. We strongly encourage the agency to move forward with the rulemaking to address PM and NOx emissions for 2007 and later model year engines.

We believe that the maximum benefits associated with the proposed new certification standards can only be realized if EPA also adopts a more rigorous in-use compliance program which will include both the manufacturer based in-use testing program proposed *and* an EPA run in-use compliance program. The Agency has the appropriate authority to test and recall non-complying engines. Committing the proper level of resources to

this aspect of the program must become a priority for EPA. The return on this investment would be tremendous in terms of public health and environmental benefits.

We urge EPA to seriously consider these comments. Let us know if there is anything that NESCAUM can do to assist EPA in developing and assessing options for reducing emissions from this very important source category.

Sincerely,

Jason S. Grumet
Executive Director