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Arthur N. Marin, Executive Director

March 26, 2007

Stephen L. Johnson, Administrator
U.S. Environmental Protection Agency
Mail Code 6102T
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Attention: Federal Register Docket ID No. EPA-HQ-OAR-2005-0047

RE: Notice of Proposed Rulemaking: *Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; Regulations Requiring Onboard Diagnostic Systems on 2010 and Later Heavy-Duty Engines Used in Highway Applications Over 14,000 Pounds; Revisions to Onboard Diagnostic Requirements for Diesel Highway Heavy-Duty Vehicles Under 14,000 Pounds*

Dear Administrator Johnson:

The Northeast States for Coordinated Air Use Management (NESCAUM) offers comments in response to the above-referenced rulemaking proposed by the United States Environmental Protection Agency (EPA). NESCAUM is an association of air quality agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. Onboard Diagnostic (OBD) systems for light-duty vehicles have proven essential in facilitating the diagnosis and correction of engine and emission system problems. Air quality and public health in the northeast states have benefited from this program. Accordingly, NESCAUM strongly supports incorporating OBD systems into the heavy-duty fleet. Our specific comments follow.

Quantifying Emissions Benefits

As noted by EPA in this proposal, the 2004 and 2007 highway engine standards represent a new era of emissions controls for diesel engines. Among the most significant technology developments associated with these standards is the widespread introduction of add-on controls such as exhaust gas recirculation systems and exhaust after-treatment devices including diesel particulate filters and NOx catalysts. Similar technologies will be deployed on nonroad engines when those standards are phased in between 2008 and 2014. As EPA notes, these devices will experience deterioration and malfunction over time and emissions will increase unless these devices are properly maintained. The OBD system provides the necessary means to alert vehicle owners and service technicians (and potentially state enforcement program personnel) of problems that would otherwise go undetected. This facilitates making necessary repairs, thus preserving the emissions benefits contemplated under the above-referenced federal engine standards.

Unfortunately, there is a significant problem in this proposal, as acknowledged by EPA. The current version of EPA's MOBILE model assumes zero deterioration of emissions for most heavy-duty diesel engines over their lifetime. In order to appropriately account for emissions from this sector in their State Implementation Plans and assess the cost-effectiveness of heavy-duty inspection and maintenance (I/M) programs, it is critical that EPA update the MOBILE model to reflect the technology changes introduced by the new standards and their impact on emissions from affected engines and equipment. We therefore urge EPA to expeditiously develop the necessary technical tools and policy guidance to enable states to determine the deterioration offset benefit from an OBD program.

Inspection and Maintenance Programs

As noted in the proposal, a heavy-duty OBD system creates new opportunities for more sophisticated heavy-duty I/M programs that can ensure vehicle owners take appropriate remedial steps in response to malfunctioning or deteriorating emission controls. However, it is well known that states frequently encounter resistance when seeking authorization to implement I/M programs. Those opposed to I/M programs are likely to use the absence of quantifiable emissions credits from the MOBILE model as an argument against such programs. For this reason, we once again, urge EPA to give states the necessary tools to quantify the benefits of an OBD program for heavy-duty vehicles.

We also take note of the suggestion in the proposal that heavy-duty OBD I/M programs may be fleet or corporate-based, rather than following the traditional state models used for light-duty OBD I/M programs. Individual states must have the ability to design I/M programs that best fit their particular circumstance. Consequently, EPA should provide the appropriate technical and policy resources to accommodate these diverse needs. We therefore urge EPA to work with program personnel in the state agencies to develop model I/M program guidance which, among other things, addresses the emissions benefits achievable under I/M programs of varying configurations.

Matching OBD System with Engine Family and Chassis

One of the key obstacles faced by states attempting to implement effective heavy-duty vehicle emissions control programs is the absence of a system to cross-reference engines with vehicle chassis. In contrast to most lines of light-duty vehicles, heavy-duty engine and chassis manufacturers are often separate entities. Consequently, there is currently no mechanism to enable identification of the engine through information on the chassis. The engine has its engine serial number (ESN) and the chassis has its vehicle identification number (VIN), but the two numbering systems are completely independent. In addition, the ESN is often extremely difficult to access because of its location on the engine block.

The Low NOx Rebuild Program[1] is an example where a link between engine and chassis identification would have been helpful. Typically the best state resource for vehicle owner information is the motor vehicle registration database, which includes the VIN. However, because the VIN for heavy-duty vehicles does not include information about the engine, registration databases cannot be used to identify and contact owners of affected vehicles under the Low NOx Rebuild Program. Unfortunately, no other readily available data source exists for identifying affected truck owners.

The pending implementation of an OBD program for heavy-duty vehicles provides a fresh opportunity to rectify this problem. There should be a simple means for state agency personnel, service technicians, and owners (particularly second and later generation owners) to determine, by examining a serial number placed on the chassis (from the VIN itself or a separate label provided by the engine manufacturer) displaying, what engine has been installed, if the installed engine is OBD-equipped, and if so equipped, what type of OBD system is present. The OBD system also should be readily identifiable through a scan tool reading.

OBD Profiles

Recognizing that different engine configurations are likely to have differing OBD monitors, EPA should require engine manufacturers to make their OBD profiles available to state enforcement agencies as a means to verify that all monitors are reporting data.

OBD Systems and Engine Life

We strongly support EPA's proposal to require that OBD systems be designed to operate for the actual life of the engine (i.e., no deactivation based on age or mileage). Considering that heavy-duty vehicles and their engines remain in service for a long time and that in-use deterioration of engine systems results in increased emissions from the older fleet, it is very important to have the means to continue to identify, diagnose, and repair problem engines in order to preserve the emissions benefits of advanced technologies. If an OBD system is allowed to be deactivated based on age or mileage, this inappropriately dictates a sunset date for state I/M programs. In addition, beyond simply remaining functional for the life of the equipment, aging OBD systems must retain their capability to accurately read and register component performance and emissions thresholds.

OBD Requirements for Land-Based Nonroad Equipment

NESCAUM recognizes the challenge that would be posed in applying identical OBD requirements to nonroad and highway equipment. The diverse range of operating characteristics for nonroad engines and the differences in typical duty cycles compared to highway engines strongly suggest taking somewhat different approaches. Therefore, we support the concept of developing nonroad OBD requirements that rely more heavily on monitoring component

[1] The Low NOx Rebuild Program is the program established under consent decrees between EPA, the Department of Justice, and certain manufacturers of heavy-duty diesel engines and referenced in 63 Fed. Reg., 59,330 (November 3, 1998).

performance (e.g., after-treatment devices, sensors, and fuel systems), compared to monitoring emissions thresholds. However, we support including emissions threshold approaches for nonroad OBD systems where practical. For example, if certain engine families are commonly used to operate nonroad equipment under prolonged steady-state conditions, an emissions threshold approach may be quite practical. In addition, analogous to the drive cycle options to be made available for OBD monitoring of highway vehicles, it may be possible to identify common nonroad duty cycles for which an emissions threshold monitoring approach is practical.

Communication Protocols

We also support requirements for communication protocols that enable onboard information to be read by a scan tool or other offboard device. This is a very effective means to diagnose and ultimately correct engine emissions problems. In this regard, we especially want to emphasize the importance of common communication protocols that are readable by universal scan tools. Universal scan protocols will enable equipment owners and service technicians to diagnose engine and emission control system problems for a wide variety of equipment and help to ensure effective repairs. These tools are also critical for I/M programs. This capability becomes especially important as equipment ages and becomes more prone to malfunction, and dealer and manufacturer support diminishes.

Emissions Thresholds Approach for Monitoring Various Components

We support requiring stringent OBD thresholds (i.e., OBD detection at lower emissions levels) that will, among other things, induce manufacturers to produce more durable emission controls. Accordingly, we support using the emissions thresholds listed in Tables II.B–1 and II.C.–1 as trigger points for requiring malfunction indicator light (MIL) illumination and storing diagnostic trouble codes (DTC). These thresholds are likely to achieve the balance sought by EPA between environmental protection, system capabilities, and avoidance of repairs where costs are high compared to emissions benefits.

NESCAUM is concerned about the potential inconsistency between EPA's and California's threshold requirements beginning in model year 2013. Further, we are concerned about the inconsistency regarding the date when EPA proposes that all engine families and ratings become liable to certification thresholds (2019), compared to the effective date for California engines (2016). We take note of EPA's intent to monitor the efficacy of the California thresholds for the purpose of determining whether equally stringent Federal thresholds are appropriate. Consistent with the 2004 EPA-CARB memorandum of agreement, we urge EPA to strive to harmonize the federal heavy-duty OBD program with California's.

Definition of Driving Cycle

We support the concept of defining a driving cycle according to a specified period of continuous engine-on operation. This will help to ensure that OBD monitors that run only once per driving cycle will operate frequently enough to detect system malfunctions and that sustained engine operation does not effectively turn off these monitors.

Continuous Monitors
We support the concept of requiring certain monitors to run continuously throughout the driving cycle, including certain threshold monitors (e.g., fuel system monitor) and most circuit continuity monitors.

General Monitoring Conditions
We support the general monitoring conditions as proposed. Particularly, we support the concepts that:

- monitors should run during conditions that are technically necessary to ensure robust detection of malfunctions, avoiding false passes and false indications of malfunction;
- enabling criteria should ensure monitoring will occur during normal vehicle operation**;**
- monitoring should occur during at least one FTP transient cycle or SET; and
- monitors will run *at least* once per driving cycle in which the applicable monitoring conditions are met.

In regard to the 4th general monitoring condition above, we have taken note that throughout the proposal for various monitors, "monitoring must occur every time the monitoring conditions are met during the driving cycle in lieu of once per driving cycle as required for most monitors." Among those for which monitoring is required only once per drive cycle are so-called "major monitors (e.g., catalyst, EGR, CDPF, other diesel aftertreatment devices)". The proposal is unclear as to why some components are monitored only once per drive cycle, whereas others apparently will be monitored whenever the applicable conditions are met. We urge EPA generally to require monitors to operate whenever the applicable conditions are met unless there is some compelling reason to monitor only once per driving cycle.

In-Use Performance Tracking and Ratio
In addition to the general monitoring conditions, NESCAUM supports requirements for in-use performance tracking for the 11 listed system components (§ 86.010-18(d)(1), FR page 3292). We take note of the fact that initially EPA is proposing a minimum in-use performance ratio of 0.100 for all monitors specifically required to track in-use performance (i.e., monitors must make valid diagnostic decisions during 10 percent of the vehicles trips) and that this ratio may be revised downward, following initial years of implementation as EPA works with industry to gather data on in-use performance ratios. We further take note of the fact that 10 percent is a minimum, subject to first meeting the general monitoring conditions. For example, if a particular monitor is capable of ensuring robust detection of malfunctions during 50 percent of vehicle trips, then the higher percentage requirement would prevail. Further, we assume that any decision to revise the in-use performance ratio for any particular monitor will require further revision of this regulation, so will be subject to a new public comment process.

System Monitoring Requirements
Generally, we support the proposals outlined in Sections II.B through II.D for monitoring performance of the various systems, both for compression ignition and spark ignition engines. Further, we support the requirements, in the case of systems which are not specifically outlined

in the proposal, for manufacturers to develop and submit monitoring plans along with supporting data and analyses to demonstrate that such additional plans will be equally reliable and effective.

Standardization Requirements
We support standardization of various features, including diagnostic connectors, computer and wireless communication protocols, hardware and software specifications for service technician tools, information communicated by the onboard computer, methods for accessing onboard information, numeric designations of DTCs, and service manual terminology. Effective standardization facilitates diagnosing and repairing malfunctions and potential use of OBD checks in heavy-duty I/M programs.

Exceptions to Monitoring Requirements
Generally, we support the concept of allowing manufacturers to disable affected monitors under certain extreme conditions (e.g., high altitude, low ambient temperature, low fuel, low or high voltage) that diminish their reliability. This is provided, however, that manufacturers submit data and/or engineering analyses demonstrating that monitoring otherwise would be unreliable during the disable conditions and include an explanation as to why these monitors cannot be designed to operate reliably under the extreme condition. We expect that monitors will be automatically re-enabled whenever an extreme condition is no longer in effect. NESCAUM does not support the use of systems that need to be manually re-enabled. As experience is gained with OBD systems, manufacturers will have opportunities to improve the reliability of OBD systems. Therefore, we urge EPA not to grant open-ended authorizations to disable monitors, but rather require manufacturers to investigate improvements to the reliability of OBD systems and sunset the exceptions to monitoring requirements in subsequent model years. In addition, whenever a monitor is disabled, a subsequent OBD scan should reveal the disablement.

We have questions regarding disablement for low temperature and low fuel levels. Regarding low temperature, we assume the disabled monitors would be those affected by cold start conditions. However, even under extreme cold conditions, the engine eventually will reach normal operating temperature, allowing monitors affected by cold start conditions to operate properly. We assume these monitors can be re-enabled at this point, regardless of ambient temperatures, but the proposal appears to allow for continued disablement until ambient temperatures rise above 20 degrees. If this is in fact EPA's intent, we request an explanation. Regarding low fuel level, 15 percent of nominal tank capacity may represent a large volume of fuel, particularly in a large vehicle such as a heavy-duty truck. We therefore request an explanation as to how EPA determined that the 15 percent threshold is appropriate across the entire fleet of affected engines.

Selective Catalytic Reduction (SCR) Monitoring
An adequate supply and proper type of reductant will be critical to the functioning of SCR systems for NOx control. Therefore, we believe that in all circumstances, there should be an alternative indicator capable of readily notifying the operator of a problem with the reductant level and reductant type. The Driver Warning System, as described in EPA's November 8, 2006

Draft Guidance Document for Certification Procedure for Light-Duty and Heavy-Duty Diesel Vehicles Using Selective Catalyst Reduction (SCR) Technologies includes the necessary elements for such an alternative indicator (i.e., visual warning, escalating in intensity, distinguishable from general OBD monitors). In addition to the alternative indicator, if the reductant tank becomes empty or is filled with an ineffective reductant (e.g., water), a MIL should be illuminated and DTC registered.

Alternative ISO Symbol

ISO warning light symbols should be configured to be easily understood by the equipment operator. In this regard, we support using the engine symbol as proposed by EPA. The symbol preferred by the Department of Transportation is confusing and therefore would be less likely to properly inform the operator of an engine or emissions control system-related problem.

Proposed Changes to Existing Requirements for Medium Duty Vehicles

We support the proposed changes to requirements for diesel-powered vehicles in the 8,500 to 14,000 pound range for the purpose of making those requirements consistent with those proposed for vehicles over 14,000 pounds.

Conclusion

NESCAUM generally supports EPA's proposal to implement OBD requirements for medium and heavy-duty vehicles and equipment. If the specific concerns and suggestions given in these comments are adequately addressed, we believe this program will provide significant air quality and public health benefits. If you have any questions, please contact Eric Skelton of my staff at (617) 259-2028.

Sincerely,

Arthur Marin
Executive Director

c: NESCAUM Directors