

June 27, 2007

To: Docket ID No. EPA-HQ-OAR-2003-0190 (Electronic Submittal)

RE: Control of Emissions of Air Pollution from Locomotive Engines and Marine  
Compression-Ignition Engines Less Than 30 Liters per Cylinder; Proposed Rule

NESCAUM (Northeast States for Coordinated Air Use Management) submits the following comments on EPA's Proposed Rule for Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder. NESCAUM is an association of state air pollution control agencies in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. In general, the NESCAUM states commend EPA and strongly support this rulemaking effort. However, we have changes to suggest that will improve on the emissions benefits achievable through this rulemaking.

The need to reduce locomotive and marine diesel engine emissions is indisputable. Locomotive engines and marine engines are significant contributors to elevated levels of ozone, fine particulate matter (PM<sub>2.5</sub>), and the primary emissions of several toxic air pollutants of concern in the NESCAUM region. According to 2002 emissions inventories, these source categories are responsible for around 10 percent of mobile source nitrogen oxides (NO<sub>x</sub>) and 10 percent of mobile source PM<sub>2.5</sub>. We particularly take note of EPA's conclusion that, barring further controls, PM<sub>2.5</sub> emissions from locomotive engines and Category 1 and 2 marine diesel engines will comprise 20 percent of mobile source fine particulate pollution in 2030.

Attaining the National Ambient Air Quality Standard (NAAQS) for ozone and fine particulate matter is a high priority for the states in the Northeast. Over the past several years, states have expended considerable time and resources developing State Implementation Plans (SIPs) that will include a host of pollution reduction measures. States are also developing plans and programs to address regional haze, which are due later this year. Emission reductions of NO<sub>x</sub> and PM<sub>2.5</sub> are needed as soon as possible to enable states to attain the NAAQS by the statutory deadlines, as well as maintain the standards into the future.

Reducing diesel engine emissions to attain federal standards is first and foremost a matter of public health. Ground-level ozone and particulate matter have been linked to a range of serious respiratory health problems and they increase the risk of premature death. Diesel exhaust has also been classified as a probable carcinogen. Between 2004 and 2006, 117 monitors in the NESCAUM region recorded exceedances of the current ozone NAAQS (0.08 ppm). Over the same period, 98 monitors in the NESCAUM region measured exceedances of the daily PM<sub>2.5</sub> air quality standard. If we are to address these public health needs, it is essential to have additional timely and aggressive programs in place to reduce NO<sub>x</sub> and PM<sub>2.5</sub>.

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We are equally concerned about the impacts on public health from direct, short-term exposure to locomotive and marine diesel emissions. According to recent reports by the Clean Air Task Force,<sup>1</sup> ultrafine particle levels inside commuter train coaches, where the locomotive is leading the train, have been measured at levels as much as 17 times higher than what is measured in the ambient air. PM<sub>2.5</sub> and ultrafine particle levels in ferry passenger compartments average about three times the simultaneous levels in the ambient air. Levels of polycyclic aromatic hydrocarbons and black carbon in ferry passenger compartments are even higher relative to the ambient air.

This rule will substantially reduce emissions from the locomotive and marine sectors when fully implemented. The rule, however, can be strengthened to provide even greater emission reductions on an accelerated schedule, and many of NESCAUM's recommendations that follow reflect this position.

### **Proposed Locomotive Emission Standards**

The NESCAUM states support the proposed 0.10 gram per brake horsepower hour (g/bhp-hr) PM standard proposed for Tier 3 engines. However, we strongly encourage EPA to implement the Tier 3 standard by no later than the end of 2010, rather than the 2012 date as proposed by EPA.

We support Tier 4 emissions levels that are at least as stringent as the proposed 1.3 g/bhp-hr for NO<sub>x</sub> and 0.03 g/bhp-hr for PM. However, we strongly encourage EPA to require Tier 4 emissions levels for both NO<sub>x</sub> and PM by no later than the end of 2013, rather than the respective 2017 and 2015 dates proposed by EPA.

### **Proposed Locomotive Remanufacture Requirements**

Given the extremely long operational life of locomotive engines, remanufacture requirements are essential in order to achieve emission reductions from the existing fleet of locomotives. NESCAUM supports the Tier 0 and Tier 1 remanufacture standards as proposed, but we strongly encourage EPA to accelerate the Tier 2 remanufacture requirements to no later than the end of 2010, rather than the 2013 date proposed by EPA.

We take note of EPA's request for comments regarding possible revision of the definition of *small railroad* to ensure that intercity passenger, commuter, and larger regional freight railroads (i.e., those with annual revenues exceeding \$25 million) become subject to locomotive remanufacture requirements. While this approach will improve upon emission reductions available under current regulations, it fails to take full advantage of a very cost-effective strategy to reduce locomotive emissions from the in-use fleet. Instead, we urge EPA to extend the remanufacture requirements to include all freight railroads, in addition to intercity passenger and commuter railroads.

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<sup>1</sup> Clean Air Task Force: [No Escape from Diesel Exhaust – How to Reduce Commuter Exposure; A Multi-City Investigation of Exposure to Diesel Exhaust in Multiple Commuting Modes](#); February 2007.

Under the present definition of small railroad (line-haul with 1500 or fewer employees; local and terminal with 500 or fewer employees), the U.S. railroad statistics (below) show that only the relative few Class I freight railroads clearly are subject to remanufacture requirements by virtue of not qualifying for the small railroad exemption. On average, commuter, regional, local, and switch railroads fall well below the employee thresholds, thereby avoiding remanufacture requirements. Applying a \$25 million annual revenue threshold as the factor for defining small railroads would have the effect of bringing the “average” regional railroad into the remanufacturing program (average revenue of \$49 million, according to the table below) but would exclude many smaller regional freight railroads and likely almost all local and switch railroads.

#### U.S. Railroad Statistics (2005 – 2006)

<b>Railroad Type</b>	<b>Number of Railroads</b>	<b>Total No. of Employees</b>	<b>Average No. of Employees</b>	<b>Total Revenue (\$ Millions)</b>	<b>Average Revenue (\$ Millions)</b>
<b>Class I Freight</b>	7	162,438	23,205	44,460	6351
<b>Commuter Rail</b>	21	28,043	1335	6027 (a)	287
<b>Regional Freight</b>	30	7322	244	1480	49
<b>Local Freight</b>	320	5744	18	1120	4
<b>Switch</b>	203	6303	31	820	4

(a) This amount represents the sum of operating and capital expenses.

Sources: Association of American Railroads (2005); American Public Transport Association Fact Book (2006)

According to our review of EPA’s Regulatory Impact Analysis,<sup>2</sup> in the year 2020, the combined NO<sub>x</sub>-PM reduction cost-effectiveness of the locomotive remanufacturing standard is approximately \$456 per ton. We therefore contend that the locomotive remanufacturing component of the regulation is extremely cost effective, compared to other strategies available to the Northeast States.

The NESCAUM region would especially benefit from expanding the remanufacture requirements to include commuter railroads and local and regional freight railroads. The table below illustrates the relative proportions of various classes of railroads by rail miles in the NESCAUM region and how this picture differs from the U.S. as a whole.

Class I railroads account for a significant majority of rail miles nationally (68 percent) but represent a minority (21 percent) of rail miles in the NESCAUM region. In contrast, the fraction of regional and local rail miles (49 percent) in the NESCAUM region is nearly double the regional fraction (27 percent) nationally.

<sup>2</sup> Table 8-2 Inventory, Cost and Benefits year from 2006 – 2040, Draft Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less than 30 Liters per Cylinder, EPA, March 2007.

**Rail Miles by Class in the NESCAUM Region**

Jurisdiction	Freight Railroads				Commuter Railroads
	Class I	Regional	Local	Regional + Local	
Connecticut	7	157	167	324	
Maine	0	876	284	1160	
Massachusetts	287	475	304	779	
New Hampshire	0	148	273	421	
New Jersey	190	108	189	297	
New York	1611	302	1103	1405	
Rhode Island	0	87	0	87	
Vermont	0	30	538	568	
<b>NESCAUM Total</b>	2095	2183	2858	5041	3061
<b>U.S. Total</b>	95,664	15,388	22,519	37,907	6971
<b>NESCAUM Allocation (%)</b>	21	21	28	49	30
<b>U.S. Allocation (%)</b>	68	11	16	27	5
<b>NESCAUM % of U.S. Total</b>	2	14	16	27	44

Source: U.S. Bureau of Transportation Statistics, *State Transportation Statistics Report (2006)*

The contrast between commuter rail miles nationally (5 percent) and in the NESCAUM region (30 percent) is even more striking. In fact, almost half (44 percent) of all U.S. commuter rail track and two-thirds (68 percent) of annual commuter rail passenger miles<sup>3</sup> are in the NESCAUM region.

In summary, by applying remanufacture requirements to intercity passenger, commuter, and regional and local freight railroads, we believe there is a tremendous opportunity to reduce in-use locomotive emissions, especially in the Northeast States.

**Locomotive Idle Controls**

We strongly support EPA's proposal to require automatic engine stop/start (AESS) idle control systems on all newly-built Tier 3 and Tier 4 locomotives and on all existing locomotives that are subject to remanufactured engine standards. Emissions from locomotive engine idling pose significant health risks, particularly for persons living near railroad switch yards. AESS systems will significantly help reduce public exposure to harmful air pollutants and at the same time reduce fuel consumption.

We must disagree, however, with EPA's proposal not to require installation of auxiliary power units (APU) in any circumstance. Because of the common occurrence of sub-freezing

<sup>3</sup> American Public Transport Association, *Public Transportation Fact Book*, 2006.

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wintertime temperatures, we expect that locomotive engines in the Northeast equipped with AESS would be subject to frequent restarts in order to prevent coolant temperatures from dropping to undesirable levels. In contrast, if these locomotives are equipped with APUs, critical systems will be supplied with essential power and heat, but emissions will be reduced. At a minimum, APUs should be incorporated into new locomotives in conjunction with Tier 4 technology. Given the fact that Tier 4 will necessitate some redesign in any event and given the lead time before Tier 4 standards take effect, there should be ample opportunity to incorporate APUs into locomotive designs.

### **Refurbished Locomotives**

We note that EPA is considering incorporating emission standards and credits for refurbished locomotives (i.e., those that contain less than 50 percent but more than 25 percent, by value, previously used parts) as part of this rulemaking. We are not making specific recommendations in this regard. As a general principle, we would support a program that encourages refurbishing older locomotives that would otherwise continue to operate essentially with no emissions improvements.

### **Proposed New Marine Engine Emission Standards**

The NESCAUM states support the proposed Tier 3 and Tier 4 standards for Category 1 and 2 marine engines. However, we are concerned that the Tier 4 standards as proposed apply only to engines greater than 800 hp (600 kW). According to a recent Boston Harbor emissions inventory evaluating 41 harbor craft vessels,<sup>4</sup> 30 were powered by engines of less than 800 horsepower. In a recent emissions inventory prepared for the Port Authority of New York and New Jersey,<sup>5</sup> 33 out of 45 ferry vessels were equipped with main engines rated at less than 800 horsepower, accounting for fully one-quarter of the main engine emissions from the collective fleet. Emissions from major harbors will continue to be unacceptably high unless emission requirements appropriately address these smaller marine engines.

While presently there may be legitimate concerns regarding space constraints and catalyst performance associated with aftertreatment devices on smaller marine engines, we expect that these engineering challenges will be overcome, given sufficient lead time. Therefore, we ask EPA to regulate commercial marine diesel engines between 25 and 800 horsepower because this sector represents a significant source of emissions. We also ask EPA to consider accelerating the Tier 4 emission standard implementation dates to the 2013 to 2015 timeframe, depending on the engine power rating. Requiring Tier 4 controls on smaller marine engines will also obviate the need for EPA to address the circumvention issue, whereby vessel manufacturers install several smaller engines on vessels in an effort to circumvent the rated power thresholds for installing Tier 4 controls. Finally, we encourage EPA to consider accelerating the Tier 3 implementation dates accordingly.

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<sup>4</sup> Northeast States for Coordinated Air Use Management, Scoping Study to Evaluate Emissions from Harbor Craft, April 2006.

<sup>5</sup> Port Authority of New York & New Jersey, The New York, Northern New Jersey, Long Island Nonattainment Area Commercial marine Vessel Emissions Inventory, April 2003.

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### **Proposed Marine Engine Remanufacture Standards**

The NESCAUM states strongly encourage EPA to incorporate Alternative 5 from the Regulatory Impact Analysis to include remanufacture standards for Category 2 engines. Further, we encourage EPA to accelerate the remanufacture standards so that they become effective no later than 2009. Finally, we encourage EPA to consider incorporating a similar remanufacture program for Category 1 marine engines. While standards for ocean-going vessels (C3 engines) are not the subject of this rulemaking, we encourage EPA to continue to work through the International Maritime Organization or federal regulation to press for more stringent standards for these very large engines.

### **Standards for Foreign-Flagged Marine Vessels**

Under current rules, foreign-flagged vessels may operate in U.S. waters without being subject to the same emission standards as vessels registered in the U.S. This places U.S. registered vessels at a competitive disadvantage. We therefore urge EPA to proceed expeditiously with further rulemaking to require foreign-flagged vessels to be subject to the same standards as their U.S. registered counterparts.

### **Five-year Delay for Recreational Marine Engines**

We concur with EPA's position that the five-year compliance delay for small-volume manufacturers of recreational marine diesel engines, as provided in current regulations, is unnecessary for the purpose of meeting Tier 3 standards. Because we are taking the position that smaller marine engines should be subject to Tier 4 standards, we recognize that it may be appropriate to allow small-volume manufacturers some additional time to meet Tier 4 standards.

### **Residual Fuel Auxiliary Engines on Marine Vessels**

We take note of the claim by shipbuilders that they are unable to obtain certified Category 1 or Category 2 residual fuel auxiliary engines for installation on newly built vessels with Category 3 propulsion engines and that they have requested relief from the certification requirements in this circumstance. We support the solution presented by EPA to require installation of certified auxiliary engines that operate on distillate fuel, notwithstanding the requirement for a separate fueling system on the vessel.

### **Summary**

The NESCAUM states commend EPA for undertaking this initiative to reduce locomotive and marine engine emissions. When fully implemented, the EPA proposal will reduce 765,000 tons of NOx and 28,000 tons of PM annually. If the changes suggested by the NESCAUM states are incorporated, the rule will result in more significant, and much needed, reductions in an expedited timeframe. We strongly urge EPA to finalize the emission standards by the end of calendar year 2007. If you have any questions, please contact Eric Skelton of my staff at (617) 259-2028.

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Sincerely,

A handwritten signature in cursive script, appearing to read "Arthur N. Marin".

Arthur N. Marin  
Executive Director

Cc: NESCAUM Directors