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FOGHORN Focus:

# Environmental Issues



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**EPA Finalizes Tougher Emissions  
Rules for Marine Engines**

# EPA Finalizes Tougher Emissions Rules for Marine Engines

By Ed Welch, PVA Legislative Director

Over the period between 2012 and 2017, newly manufactured marine engines of the size and type commonly used by PVA vessel members must meet stricter air emissions requirements. The U.S. Environmental Protection Agency (EPA) announced its so-called Tier 3 and Tier 4 regulations on March 14 and published them in the *Federal Register* on May 6, 2008.

EPA justified the rule by noting that in the absence of additional control measures, rail and marine entities will be responsible for an increasing percentage of national emissions from mobile sources over the next 30 years. The projected “bump” in the percentage is not necessarily because actual emissions from these sources will increase much, but mainly because on-road transportation and non-road (other than marine), emissions are falling rapidly since they have already been subject to stricter emissions rules. EPA believes that when the tougher standards for marine engines are fully phased in, particulate matter emissions will fall by 90 percent and nitrogen oxides emissions will decrease by 80 percent compared to marine engines meeting the current EPA standards.

EPA proposed these stricter requirements in April 2007. PVA participated in the rulemaking process by submitting written

comments to the regulatory docket on July 2, 2007, and testifying at public hearings in May 2007 in Chicago and Seattle.

The official name of the final rule is “Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines less than 30 Liters per Cylinder.” EPA said that it is “adopting a comprehensive program to dramatically reduce pollution from locomotives and marine diesel engines. The controls will apply to ... all types of marine diesel engines below 30 liters per cylinder displacement, including commercial and recreational, propulsion and auxiliary.... The long-term emissions standards for newly-built ... marine diesel engines are based on the application of high-efficiency catalytic aftertreatment technology. These [long-term] standards begin to take effect ... in 2014 for marine diesel engines.”

Marine diesel engines below 30 liters per cylinder displacement are used to power a wide variety of vessels, including ferries, excursion vessels, small fishing and recreational boats, tugs, and Great Lakes freighters. Most marine engines used by PVA members fall within this classification (Categories 1 and 2). Some ferry operators may employ Category 3 engines (marine diesel engines at or above 30 liters per cylinder); these larger engines are

also used for propulsion power on oceangoing ships. EPA is addressing Category 3 engines through separate regulatory actions.

The final rule has three parts:

**Remanufacturing of certain existing engines.** For the first time, EPA is setting stringent emission standards for existing commercial marine diesel engines above 600 kilowatt (kW) (800 horsepower (hp)). These standards apply if and when the engines are remanufactured. “Remanufacture” is defined as the removal and replacement of all cylinder liners, either during a single maintenance event or over a five-year period. Any rebuilding or maintenance of the engine that falls short of this definition does not trigger the remanufacturing requirement. This part of the program will take effect as soon as certified remanufacture systems are available. EPA justifies the need for a remanufacture requirement by noting that marine engines have lengthy working lives, sometimes reaching or exceeding 40 years.

**Near-Term Emission Standards (Tier 3) for newly-built marine engines.** The Tier 3 standards will require technological advances within engines to reduce emissions of particulate matter (PM) and oxides of nitrogen (NOx). Tier 3 standards for new Category

1 engines phase in between 2009 and 2012. Tier 3 standards for new Category 2 engines phase in between 2013 and 2014.

### **Longer-Term Emission Standards (Tier 4) for certain newly-built marine engines**

(above 600 kW or 800 hp). Tier 4 standards assume that engines will employ high-efficiency catalytic aftertreatment technology. Aftertreatment systems will require the use of ultra-low sulfur diesel fuel (ULSD), which is expected to be widely available. The Tier 4 standards phase in for affected marine engines starting in 2014 and extending to 2017. EPA believes that marine diesel engines designed to these Tier 4 standards will achieve PM reductions of 90 percent and NOx reductions of 80 percent, compared to engines meeting the Tier 2 standards in force today.

For the most part, the regulations apply directly only to engine manufacturers. Assuming that the cleaner engines will be more expensive to produce, vessel owners will be affected primarily in the pocket-book. However, certain parts of the

rule are of specific interest to vessel owners and operators. For instance, even after the requirement for category 4 engines with aftertreatment systems, the regulation permits one to replace an existing Category 3 marine engine with another of like characteristics, assuming that there is no category 4 engine with appropriate physical or performance characteristics to repower the vessel. Also, the owner and operator of a vessel equipped with an engine with a selective catalytic reduction system requiring the use of urea or other reductants must report to the EPA if the vessel is operated without these products. Finally, the rule says that if an existing vessel is modified and the value of the modifications exceeds 50 percent of the vessel prior to the project, the vessel will be considered to be "new," thereby requiring the installation of new cleaner-emission engines.

In addition, vessel owners and builders will have to ensure that a required emission label is visible when the engine is installed; if it is not, they will need to obtain a duplicate label from the engine manufacturer and install it in a location

where it can be easily seen. They will also have to make sure that a tier 4 engine has a label near the fuel inlet stating that ultra-low-sulfur fuel is required.

Makers of marine engines will be able to produce compliant models at the time required by the EPA rule, according to the Engine Manufacturers Association. EMA's statement agreed that the new standards "will significantly reduce emissions from new marine and locomotive engines and establish very challenging stretch goals for the industry." Acknowledging that "it will not be an easy task," EMA maintained, "We are prepared to meet the challenge."

This massive rule takes up 254 pages in the *Federal Register*. It can be accessed see previous note on link on the EPA web site at [www.epa.gov/otaq/marine.htm](http://www.epa.gov/otaq/marine.htm); click on the link to "2008 Locomotive Engines and Marine Diesel Emission Standards."

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