

Similarly, we are not adopting Tier 1 emission standards for HC or CO emissions because the short lead time does not allow manufacturers sufficient time to do the testing and design work that would be necessary to ensure compliance with such standards. As described in the proposal, the focus of controlling emissions from Category 3 engines is on NO_x. The standards we contemplated for HC and CO in the proposal would have achieved modest reductions from baseline levels or, more likely, merely prevented increases in these pollutants as manufacturers apply emission-control technologies to address NO_x emissions. Manufacturers do not have a complete data set to characterize HC and CO emissions from their Category 3 engines, so some engines may well have emission rates above the level we would consider to be a cap that would merely prevent increasing emissions. The short lead time associated with the Tier 1 standards is too short to allow manufacturers in these cases to address this potential. As a result, we believe it is most appropriate to include appropriate emission standards for HC and CO emissions in the future rulemaking, as described below.

Engine manufacturers are meeting the Annex VI standards today with a variety of emission-control technologies. These basic emission-control technologies include a variety of in-cylinder technologies, generally including optimized turbocharging, higher compression ratio, and optimized fuel injection, which may include timing retard or changes to the number and size of injector holes to increase injection pressure.

D. Voluntary Low-Emission Standards

Several state and environmental groups and manufacturers of emission controls have supported our efforts to develop incentive programs to encourage the use of engine technologies that go beyond federal emission standards. Some companies have already significantly developed these technologies. In the final rule for land-based nonroad diesel engines, we included a program of voluntary standards for low-emitting engines, referring to these as "Blue Sky Series" engines (63 FR 56967, October 23, 1998). We included similar programs in several of our other nonroad rules, including that for commercial marine diesel engines. The general purposes of such programs are to provide incentives to manufacturers to produce clean products as well as create market choices and opportunities for environmental information for

consumers regarding such products. The voluntary aspects of these programs, which in part provides an incentive for manufacturers willing to certify their products to more stringent standards than necessary, is an important part of the overall application of "Blue Sky Series" programs. While these are voluntary standards, they become binding once a manufacturer chooses to participate. EPA certification will therefore provide protection against false claims of environmentally beneficial products. For the program to be most effective, however, incentives should be in place to motivate the production and sale of these engines. These incentive programs can be put in place by users and state and local governments.

To be designated as a Blue Sky engine, an engine must have emissions at least 80 percent below Annex VI NO_x levels. The specific voluntary low-emission NO_x standard is expressed as $9.0 \times n^{-0.2}$ (in g/kW-hr), with a cap of 3.4 g/kW-hr for engines with rated speed over 130 rpm (no specific standard applies to engines over 2000 rpm, because Category 3 engines all have engine speeds well below 2000 rpm). Data suggest that engines utilizing selective catalytic reduction should be able to meet these emission levels. Establishing an objective qualifying level for voluntary low-emission engines allows state and local governments or individual port authorities to develop meaningful incentive-based programs to encourage preferential use of these very low-emitting engines.

Engines certified to the voluntary low-emission standards must also meet HC and CO standards reflecting baseline emission levels for these pollutants. As described in the proposal, we believe the appropriate levels to cap emissions of these pollutants are 0.4 g/kW-hr for HC and 3.0 g/kW-hr for CO.

IV. Future Actions

The standards we are adopting in this action are equivalent to the internationally negotiated standards contained in MARPOL Annex VI and are expected to achieve a 20-percent reduction in the national Category 3 NO_x inventory by 2030. As noted in Section I, the inventory contribution of these engines to local NO_x and PM inventories, particularly around commercial ports and coastal areas, can be significant. We recognize that manufacturers can achieve additional reductions with more lead time than is provided by the Tier 1 standards. They can do this by expanding the use and optimization of in-cylinder controls and

by incorporating advanced technologies, such as selective catalytic reduction or water injection, that may achieve much greater reductions. We believe, however, that it is appropriate not to make a final decision on setting the longer-term Tier 2 standards in this final rule. This section describes how we plan to conduct a future rulemaking that will address a new tier of standards.

Separately, we also intend to pursue additional action to set controls for the fuels used by these engines. The sulfur content of these fuels is considerably higher than the fuel used in land-based nonroad engines. This high sulfur content leads to high PM and SO_x emissions. MARPOL Annex VI contains a provision that would require ships to use lower sulfur fuel when operating in specially designated SO_x Emission Control Areas, or be equipped with an exhaust gas cleaning system or other system that reduces the total SO_x emissions from the ship to 6.0 g/kW-hr or less. If the Annex goes into force, we will assist the other federal agencies in investigating and developing an application to the IMO by the United States for designating relevant coastal and port areas as SO_x Emission Control Areas. If the Annex does not go into force, we may address this issue under our existing authority in a future rule. In addition, we are considering fuel controls as part of the nonroad diesel rule that is currently under development that could affect the distillate fuels used by marine vessels.

A. Future Rulemaking for Engine Standards

1. What Is the Timetable for the Future Rule?

We are adopting a regulatory provision in 40 CFR 94.8 that establishes a schedule for a future rulemaking to promulgate additional engine controls that EPA determines are appropriate under section 213(a)(3) of the Act. This future rulemaking will reassess the standards in place at the time using information about the feasibility of optimizing in-cylinder controls and applying advanced NO_x and PM control technologies to these engines. We intend to consider an additional tier of standards for all marine diesel engines and will also consider application of these standards to engines on foreign vessels that enter U.S. ports. We will also include in our evaluation an assessment of the status of international action to set more stringent standards. The standards in this final rule will remain in effect unless modified by a future rulemaking. We are committing to take final action