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EPA Proposes New Air Emission Standards for Large U.S.-Flag Vessels

On July 1, EPA announced the next step in a coordinated strategy to cut emissions from oceangoing vessels. EPA will soon issue a proposed rule under the Clean Air Act (“CAA”) that sets more stringent engine standards for U.S.-flagged ships that would harmonize with international standards to help improve air quality. EPA is now going through an informal period where it has invited comments on this concept. Although not part of the formal rulemaking process, this initial comment period is likely to shape what this rule ultimately looks like, just as a similar comment period did for the vessel general permit issued earlier this year¹. The regulated community should take the opportunity to participate in this process. Even making submissions after the formal hearings could help inform the agency decision-making process.

Why is EPA Proposing These Standards?

Vessels are one of the most environmentally efficient methods of moving cargo. At the same time, however, EPA describes oceangoing vessels as significant mobile source emitters of pollutants. According to EPA, marine diesel engines known as Category 3 engines being produced today need only meet relatively modest emission requirements, thereby generating significant emissions of particulate matter (PM), nitrogen oxide (NOx), sulfur oxides (SOx) and toxic compounds such as carbon monoxide associated with adverse health effects.

EPA estimates that when fully implemented, the proposed standards, in conjunction with other clean air strategies for vessel emissions, will reduce NOx emissions by 80 percent and PM emissions by 85 percent, compared to the current limits applicable to Category 3 engines. Additionally, by 2030, EPA says that due to the significant health and welfare benefits associated with cleaner air, between 13,000 and 33,000 premature deaths will be prevented annually. The agency estimates that the monetized health benefits by 2030 would be between \$110 billion to \$280 billion assuming a 3 percent discount rate.

Current Standards

Current CAA standards for Category 3 engines have been in effect since January 2004. These standards are equivalent to the current Tier I international standards contained in MARPOL Annex VI (“Annex VI”).²

¹ Please visit the following website to view the e-alert, “EPA Issues Final Clean Water Act Permit for Incidental Discharges From Vessels”: <http://www.klgates.com/newsstand/Detail.aspx?publication=5211>.

² Note that the MARPOL Annex VI standards are referred to as Tiers I, II, and III; EPA’s Category 3 emission standards are referred to as Tiers 1, 2, and 3.

Adopting new, stricter standards will make the U.S. regulations consistent with new, international emission control standards being adopted by the International Maritime Organization (“IMO”) through amendments to Annex VI. According to EPA, additional emission control standards on Category 3 engines are now possible because of the feasibility of applying high-efficiency after-treatment technologies to these engines.

Proposed Clean Air Act Standards

Proposed Category 3 Engine Standards

EPA’s proposal would revise the CAA engine program to include two additional tiers of NOx standards for new Category 3 engines installed on U.S.-flagged vessels. The first stage of proposed standards (Tier 2) would apply to newly built engines and would require more efficient use of current engine technologies, such as engine timing, engine cooling and advanced computer controls. Tier 2 standards, which would take effect in 2011, would result in a 15 to 25 percent NOx reduction below the current Tier 1 levels. The proposed Tier 3 standards would apply to new engines starting in 2016 and would require the use of high-efficiency after-treatment technology such as selective catalytic reduction to achieve NOx reductions 80 percent below current levels.

In addition to the NOx limits, EPA is proposing standards for hydrocarbon and carbon monoxide emissions from new Category 3 engines. EPA is not proposing to set a standard for PM emissions for such engines. The agency has said that significant PM emissions benefits will be achieved through the ECA fuel sulfur requirements that will apply to ships operating in areas affecting U.S. air quality. However, EPA is proposing to require engine manufacturers to measure and report PM emissions.

Effectiveness Dependent on IMO Actions

The effectiveness of EPA’s proposed standards is contingent upon the designation of U.S. coasts as an Emission Control Area (ECA) pursuant to Annex VI. IMO’s new strictest Tier III NOx limits, adopted in October 2008, apply only in designated ECAs.³ EPA anticipates that Annex VI will be

³ On October 2008, the IMO amended Annex VI to add new tiers of engine NOx emission standards and fuel sulfur limits. Beginning in 2015, all ships operating in ECAs will be required

amended to include the recent U.S. and Canadian government application to establish an ECA that stretches from the countries’ coastlines out to 200 nautical miles and includes Hawaii and southeastern Alaska. If the IMO does not adopt the ECA proposal, EPA will take supplemental action to control vessel air emissions.

Who Will be Impacted by the Proposed Standards?

EPA’s proposed standards will apply to:

- Companies that manufacture, sell, or import into the United States new marine Category 3 engines for use on vessels flagged or registered in the United States;
- Companies and persons that construct vessels to be flagged or registered in the United States that will use Category 3 engines; and
- Owners and operators of such U.S. vessels.

The EPA has said that the proposed standard “may” affect companies and persons that rebuild or maintain Category 3 engines and those that manufacture, import, distribute, sell and dispense fuel for use by Category 3 marine vessels. EPA’s pre-publication preamble for the proposed standards states, “Although we are not proposing standards for existing engines on vessels already in the U.S. fleet, we are seeking comment on a programmatic alternative (Voluntary Marine Verification Program) that would help reduce emissions from those engines.”

to use fuel with no more than 1,000 parts per million (“ppm”) sulfur. Starting in 2016, new ships operating in ECAs must also have advanced technology engines designed to cut emissions of ozone-forming oxides of NOx by approximately 80 percent. New fuel standards will phase in over time beginning with an interim fuel standard of 10,000 ppm in July 2010.

IMO Tier I standards apply to diesel engines installed on a ship constructed on or after January 1, 2000 and prior to January 1, 2011 and utilize existing technology, such as optimized turbocharging and fuel injection. Tier II standards apply to diesel engines installed beginning January 1, 2011 and are expected to be met by combustion process optimization. Tier III standards, effective January 1, 2016, will require dedicated NOx emission control technologies. Tier I and Tier II standards are global; however Tier III standards apply on in designated ECAs.

Voluntary Marine Verification Program

To encourage emission reductions from existing Category 3 engines, EPA would like to establish a voluntary reduction program. In conjunction with state or local incentives, the proposed program would provide incentives for owners to achieve, on a voluntary basis, greater emission reductions earlier than required for new Category 3 engines, and to retrofit existing Category 3 engines with more advanced NOx emission control technologies. Should EPA establish this program, program incentives would then be determined by States, localities and ports to encourage vessel owner participation.

The program would be available to Category 3 propulsion engines on new or existing vessels, and would be based on achieving the Tier 2 or Tier 3 NOx limits and not on a percent reduction from a baseline. Owners could achieve the NOx limits by adjusting the engine, retrofitting engine components, or retrofitting with an after-treatment device. EPA, however, will not consider an exhaust gas scrubber to be an acceptable control strategy for reducing NOx emissions. EPA is seeking comment on this proposed program.

Vessel Compliance with the Proposed Standards

Ships constructed beginning in 2016 will have to comply with the Annex VI Tier III NOx limits, which are equivalent to EPA's proposed standards. These standards will apply to any vessel built beginning in 2016 while it is operating in an ECA. Advanced after-treatment, such as selective catalytic reduction, will be the most likely approach to meet the proposed NOx limits. Whether existing ships will be affected will depend on the implementation of the voluntary program.

With respect to the proposed fuel standards, which become applicable in 2015, EPA says that it will result in the use of distillate fuel for operation in ECAs. This would require the vessel to switch from a higher sulfur fuel to 1,000 ppm sulfur fuel before entering into the ECA. As an alternative to low sulfur fuel, an exhaust gas cleaning device, known as a SOx scrubber, could be used to remove sulfur from the exhaust.

ECA Designation and Foreign-Flagged Vessels

EPA notes that because the NOx standards adopted in the recent amendments to Annex VI are comparable in stringency and timing to the agency's proposed standards, CAA Tier 2 and 3 standards will not be extended to foreign-flagged vessels at this time. However, should the U.S.-Canada ECA proposal be adopted by IMO, NOx standards comparable to EPA's proposed standards will be applicable to engines on foreign-flagged vessels operating in U.S. waters and will be enforced under the authority of the Act to Prevent Pollutions from Ships.

When operating outside a designated ECA, engines on foreign-flagged vessels must meet the global Tier II NOx standard, which otherwise applies to engines on ships beginning in 2011 and will require a 20% reduction from the current Tier I levels. EPA has said that it will revisit the application of the proposed standards to foreign-flagged vessels if the U.S.-Canada ECA is not considered in a timely manner and adopted.

Parties to Annex VI must adopt the proposed ECA amendment, if it is approved by IMO. IMO gave its initial approval for the U.S.-Canada proposal at the 59th session of the Marine Environment Protection Committee meeting ("MEPC 59"), which was held the week of July 13, 2009. The earliest possible adoption date following the MEPC 59 meeting is the following MEPC meeting, which is anticipated to take place in March 2010. Given the typical amendment acceptance process, an ECA adopted on this timeline could be expected to enter into force as early as August 2012.

The proposed standards specify that vessels flagged by a country that is not a party to MARPOL (known as non-Party vessels) must comply with Regulations 13, 14, and 18 of Annex VI when operating in U.S. waters.⁴ This requirement would fulfill 33 U.S.C. 1902(e), which requires the adoption of regulations for non-Party vessels so that they are not treated more favorably than vessels of countries that are

⁴ Regulation 13 establishes NOx emissions limits. Regulation 14 establishes SOx and PM limits and sets requirements within ECAs. Regulation 18 covers issues related to fuel quality, sampling and delivery requirements.

party to MARPOL. However, since non-Party vessels cannot obtain Engine International Air Pollution Prevention certificates, the proposed provision requires non-Party vessels to obtain equivalent documentation of compliance with the NOx standards of Annex VI.

Key Compliance Dates for New & Proposed Vessel Air Emissions Standards

Date	Standard
July 2010	Interim fuel standard begins.
2011	Tier II NOx standards for new engines.
August 2012	ECA effective date (this is the earliest the ECA could be expected to enter into force).
2015	New fuel standards begin (switch to 1,000 ppm sulfur).
2016	Tier III NOx standards for new engines.

Costs Associated with the Proposed Standards

EPA estimates that the cost of implementing the proposed strategy is approximately \$1.85 billion in 2020, increasing to \$3.11 billion 2030. Nearly 86 percent of the 2020 costs are attributable to the use of higher-cost lower-sulfur fuel in the proposed ECA. Operational costs are estimated to be at \$1.82 billion in 2020 and the application of engine controls are expected to be \$32.7 million in 2020 and increasing to \$48.5 million in 2030 as more ships are built to comply with Annex VI Tier 3 NOx limits.

Related State Action

July 1, 2009 marked the implementation date of new California state regulations that require all oceangoing vessels within 24 nautical miles of the California coastline to use cleaner burning diesel fuel. The regulations are aimed at reducing SOx, NOx and PM emissions. The requirement, adopted in 2008, will annually affect nearly 2,000 oceangoing vessels – both U.S.- and foreign-flagged. The vessels must use lower-sulfur marine distillates rather than the usual heavy-fuel oil known as bunker fuel.

Use of the cleaner fuel will be phased in, but the California Air Resources Board (“CARB”) claims that significant emission reductions will be immediate. The agency has said that initially, 13 tons-per-day of PM emitted from the vessels’ diesel engines will be eliminated. CARB also says that the switch will eliminate an estimated 3,600 premature deaths between 2009 and 2015.

CARB representatives say that the new regulations are extremely cost-effective and that the fuel is readily available. The agency has estimated that compliance with the regulations would typically add \$30,000 to a California port visit – approximately one percent of the typical fuel costs for a vessel crossing the Pacific Ocean.

What Happens Next?

The proposed rule must be published in the Federal Register; once it is published, the public will have the opportunity to submit formal comment. Additionally, EPA has announced two public hearings to discuss the proposed standards; one was held in New York City on August 4, 2009 and the second will be held in Long Beach, CA on August 6, 2009. The meetings will provide interested parties the opportunity to present data, views, or arguments concerning the proposed rule. EPA may ask clarifying questions during the oral presentations, but will not respond to the presentations at that time.

For more information on EPA’s proposed standards, please visit:
<http://www.epa.gov/otaq/oceanvessels.htm>.

For more information on the new CARB regulations, please visit:
<http://www.arb.ca.gov/ports/marinevess/marinevess.htm>.

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