Program Announcement

International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels

On October 9th, the 168 Member States of the International Maritime Organization (IMO) adopted stringent new standards to control harmful exhaust emissions from the engines that power ocean-going vessels (OGVs). This is a critical first step that may eventually help millions of Americans and many more people around the world to breathe cleaner air. To fully realize the significant benefits of this program, countries must seek an emission control area (ECA) designation from the IMO. The U.S. Environmental Protection Agency (EPA), in partnership with the Coast Guard, Navy, National Oceanic and Atmospheric Administration, Maritime Administration, and State Department, played a significant role in the complex negotiations leading up to this agreement.

What did the IMO do?

The IMO adopted a comprehensive program of engine and fuel standards, detailed in amendments to Annex VI to the International Convention for the Prevention of Pollution from Ships (also called MARPOL), that closely matches a proposal submitted by EPA and its Federal partners to the IMO last year.

Like the original Annex VI program, the new standards are geographically-based. That is, ships operating in areas with air quality problems, designated as Emission Control Areas (ECAs), are required to meet tighter emission limits. Beginning in 2015, new and existing ships operating in ECAs will be required to use fuel with no more than 1,000 parts per million (ppm) sulfur, or a 98% reduction from today's global cap. Beginning in 2016 new ships operating in ECAs must also have advanced-technology engines designed to cut emissions of ozone-forming oxides of nitrogen (NOx) by roughly 80%. The new fuel standards will phase in over time beginning with an interim fuel sulfur standard in 2010. The IMO did not designate any new emission

EPA United States Environmental Protection Agency

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control areas in this action. Countries will need to seek such a designation in order to realize fully the benefits of this program. The EPA is working closely with all parts of the Federal Government to prepare an application for ECA status for our coasts and will submit that application to IMO as soon as possible.

Emissions from ships operating outside of designated ECAs will be reduced through engine and fuel standards. OGVs everywhere will be required to use fuel with at most 5,000 ppm sulfur, or a 90% reduction from today's global cap. This fuel standard will begin in 2020, pending a fuel availability review in 2018. The engine standards will apply to new engines in 2011, and to existing engines as certified low-emission kits become available, beginning in 2011.

What ships are affected?

The new international standards contained in the Annex VI amendments apply to all new marine diesel engines above 130 kW (175 hp) and all marine diesel fuels. For vessels flagged and registered in the United States, EPA's clean diesel engine and fuel standards (www.epa.gov/otaq/marine.htm#2008final) will apply for all but the very largest new marine diesel engines (those above 30 liters per cylinder displacement). For engines above 30 liters per cylinder and for residual fuels, the new Annex VI standards will apply.

Most importantly, the new international standards will apply to all new marine diesel engines and fuels on foreign vessels that operate near America's coasts and ports. These foreign flagged vessels account for the vast majority of OGV traffic in the U.S.

How do oceangoing vessels harm U.S. air quality?

Oceangoing vessels dock at over a hundred ports in the U.S., including some along navigable waterways in the nation's interior. More than 40 of these ports are in metropolitan areas that do not meet the National Ambient Air Quality Standards (www.epa.gov/air/criteria.html). These vessels also travel along our populated coasts and waterways. Most have, at best, very modest air pollution controls and many have no controls at all, emitting pollutants at levels (measured in grams per horsepower-hour) typical of highway trucks built before the 1980's. Furthermore, these emissions of particulate matter (PM), sulfur oxides (SOx), hydrocarbons, and NOx can degrade air quality for people living hundreds of miles downwind.

We have estimated that in 2001 marine diesel engines with per-cylinder displacement of 30 liters or more (a group roughly corresponding to the engines covered by the new IMO standards) contributed 6% of the NOx coming from all mobile sources in the U.S., as well as 10% of the PM, and 40% of the SOx. We further estimate that without new emission controls, these contributions would have increased by 2030 to 34% of the NOx coming from all mobile sources in the U.S., 45% of the PM, and 94% of the SOx. Percent contributions from these marine engines in some port cities with poor air quality range much higher.

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What will this program mean for the environment?

The final ECA standards will achieve reductions from current Tier 1 engine emission levels (www.epa.gov/otaq/oceanvessels.htm#tier1) of 80%, 85%, and 95% for NOx, PM, and SOx, respectively. Considering the large contribution OGVs make to U.S. air quality problems, especially in port cities, the health benefits from these emission reductions will be very substantial. We anticipate many billions of dollars of health and welfare benefits in the U.S. from this program if an ECA designation is made for U.S. coastlines.

Why is the IMO process important?

In today's global economy, the number of ships doing business at U.S. ports is increasing at a rapid rate. Very few of these ships are U.S.-flagged, and the fuel they burn when entering U.S. waters has typically been obtained elsewhere, at ports all over the world. This new IMO program directly addresses emissions from these foreign-flagged vessels. It requires them to meet stringent standards whenever they operate in designated ECAs.

What are the new standards?

The ECA fuel sulfur standards are:
- 10,000 ppm starting July 2010.
- 1,000 ppm starting January 2015.

The global fuel sulfur standards are:
- 35,000 ppm starting January 2012.
- 5,000 ppm starting January 2020 (subject to a review in 2018, but no delay past 2025).

The engine emission standards vary with rated engine speed according to a formula. See "Where can I get more information" below for details. Percent reductions from the existing Tier 1 standards are provided below:

The ECA engine emission standards are:
- Tier 3 for new engines: 80% NOx reduction starting January 2016 (based on the use of advanced catalytic aftertreatment systems).

The global engine emission standards are:
- Tier 2 for new engines: 20% NOx reduction starting January 2011.
- Tier 1 for existing engines: 15-20% NOx reduction from current uncontrolled levels. Manufacturers may begin certifying systems (sets of upgraded replacement parts) starting in 2010. Installation will occur at a vessel's first "renewal survey" following the Tier 1 certification applicable to the vessel's engines. A renewal survey is a major inspection and maintenance activity, typically done every 5 years.

How does this relate to EPA's recent Advance Notice on reducing pollution from oceangoing vessels?

The analyses performed for the Advance Notice and the comments received by EPA in response to it provided valuable input into the IMO process and helped it to reach a successful outcome. EPA is considering the information provided in comments on the Advance notice and through the IMO process in our Clean Air Act rulemaking on OGVs (www.epa.gov/otaq/oceanvessels.htm).

Where can I get more information?

You can get more information on the IMO program and EPA's marine engine programs from the Office of Transportation and Air Quality (OTAQ) website:
www.epa.gov/otaq/oceanvessels.htm and www.epa.gov/otaq/marine.htm

For additional information, please contact the Assessment and Standards Division at:

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