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Authors:**Susan B. Geiger**susan.geiger@klgates.com
+1.202.661.3818**Barry M. Hartman**barry.hartman@klgates.com
+1.202.778.9338**Mark Ruge**mark.ruge@klgates.com
+1.202.661.6231**Yvette T. Wissmann**yvette.wissmann@klgates.com
+1.202.661.3829

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International Maritime Organization (“IMO”) Approves Authority for U.S. to Impose Stringent New Air Emission Standards for Large Oceangoing Vessels

The final piece of authority relied upon to impose stringent new fuel and engine emission standards on large oceangoing vessels operating in U.S. waters was confirmed on March 26, 2010 when IMO approved the U.S.-Canada Emission Control Area (“ECA”) proposal. The ECA will become enforceable in August 2012.

The ECA Joins the Clean Air Act as the Basis for Stringent New Standards

When the United States Environmental Protection Agency (“EPA”) issued new air emission standards for large vessels on December 22, 2009, it cited as the basis of its authority to issue such standards both the Clean Air Act and the then-pending ECA (A K&L Gates e-alert outlining EPA’s August 2009 proposed vessel air emissions rules can be found at:

<http://www.klgates.com/newsstand/Detail.aspx?publication=5834>). The ECA proposal had been submitted to IMO for approval in March 2009 under the terms of the International Convention for the Prevention of Pollution from Ships (“MARPOL”), which allows signatory countries to designate specific portions of sovereign waters as ECAs. ECAs are subject to stricter standards than the international waters governed by the other provisions of MARPOL. The U.S.-Canada (or “North American”) ECA was proposed by EPA, in conjunction with Environment Canada, in order to “dramatically reduce air pollution from ships and deliver substantial air quality and public health benefits that extend hundreds of miles inland.”¹

The new air emission standards for larger vessels issued by EPA in 2009 affect both the fuel used on board the vessel and the pollutants allowed to be emitted from the vessel’s engine. The nitrogen oxide (“NOx”) standard is applicable to new engines and the sulfur oxide (“SOx”) standard requires the use of low sulfur fuel while in U.S. waters, including internal waters.

¹ United States Environmental Protection Agency, *Designation of North American Emission Control Area to Reduce Emissions from Ships Regulatory Announcement*. March 2010.

Where Do These New Rules Apply?

The ECA extends up to 200 nautical miles from the U.S. and Canadian coasts, but does not extend into marine areas subject to the sovereignty or jurisdiction of Mexico. The ECA includes waters adjacent to the Pacific coast, the Atlantic/Gulf coast and the eight main Hawaiian Islands.² The Great Lakes and other U.S. internal waters were included in the ECA by EPA regulatory action last year.



Above: Area of the North American ECA (Source: U.S. EPA)

What New Standards Will Apply?

In October 2008, the IMO member states, including the United States, agreed to amend MARPOL Annex VI and adopted new tiers of NOx and fuel sulfur controls.³ The most stringent emission standards were reserved for ships operating in designated ECAs, including the newly-designated ECA in North America.

International Ship Engine and Fuel Standards (MARPOL Annex VI)

	Year	Fuel Sulfur Limit	NOx Limit
Emission Control Area	Current to July 2010	15,000 ppm*	
	After July 2010	10,000 ppm	
Global	2015	1,000 ppm	
	2016		Tier III (Aftertreatment-forcing)
	Today to January 2011		Tier I (Engine-based controls)
	2011		Tier II (Engine-based controls)
	Today to January 2012	45,000 ppm	
	2012	35,000 ppm	
	2020 ⁴	5,000 ppm	

* ppm = parts per million

² The main Hawaiian Islands include the islands of Hawaii, Maui, Oahu, Molokai, Niihau, Kauai, Lanai, and Kahoolawe.

³ MARPOL Annex VI sets limits on NOx and SOx emissions from ship exhausts, and prohibits deliberate emissions of ozone depleting substances.

⁴ Subject to a fuel availability study in 2018; requirement may be extended to 2025.

The EPA states that the 2015 fuel standard of 1,000 ppm is expected to reduce particulate matter and SO_x emissions more than 85 percent from present day levels. The standard is expected to be met through fuel switching (vessels on international voyages need to switch to low sulfur fuel only for the time they are in ECAs within U.S. waters). The EPA says that most ships have existing capability to store two or more fuels, but recognizes that some vessels may require modification to accommodate additional distillate fuel storage capacity. Vessel operators may also equip their vessels with exhaust gas cleaning devices (also known as “scrubbers”) as an alternative to using lower sulfur fuel.

For NO_x emissions, the Tier II standards applicable to vessels built in 2011 and beyond represent a 20 percent NO_x reduction below Tier I. The Tier III standards, applicable in ECAs, represent an 80 percent reduction in NO_x below Tier I. EPA anticipates that ship operators will meet the Tier III standards through the use of high-efficiency aftertreatment technology.

Compliance Costs Are Substantial for Vessel Operators; Fuel Availability and Safety Concerns Exist

EPA estimates the total costs of improving air emissions from vessels operating primarily in the ECA from current performance to ECA standards will be around \$3.2 billion in 2020. The EPA Technical Support Document submitted to IMO with the ECA proposal states that, based on world modeling, the average increase in costs associated with switching from marine residual to distillate fuel will be \$145 per tonne; EPA estimates that of this amount, \$6 per tonne is the cost increase associated with distillate desulfurization.⁵ The agency also expects a modest economic impact associated with program compliance for ships engaged in the international trade.

For all affected vessel owners, however, the fuel standard continues to raise significant issues. The cost of low sulfur fuel is a primary concern. Fuel with 1,000 ppm is expected to be 40 percent more expensive than marine fuel currently in use. For vessels that operate a substantial portion of their time in U.S. waters, the cost of low sulfur fuel will be a major new expense. Additionally, fuel availability is a concern. Due to concerns associated with the production capacity available for low sulfur fuel, many vessel owners do not believe the quantity of low sulfur fuel necessary for their vessel operations in ECAs will be readily available.

Other vessel owners are concerned about the safety of fuel switching. Last summer, the Harbor Safety Committee of the San Francisco Bay Region found that propulsion failures are increasing due to fuel switching under the California Air Resources Board’s (“CARB”) low sulfur fuel standards, which took effect July 1, 2009.⁶ During an August 2009 Harbor Safety Committee Navigation Work Group meeting, U.S. Coast Guard Captain Paul Gugg, Captain of the Port, Sector San Francisco, said that the Coast Guard has documented an increase in vessel power loss, particularly on diesel-powered vessels, due to fuel switching. From September 2008 to June 2009, of the 8,630 deep draft ship arrivals, 11 casualty investigations of propulsion failures were related to fuel switching (an average of one a month). Since the CARB regulations took effect, of the 720 arrivals in July, 6 casualty investigations were initiated by the Coast Guard.⁷ Captain Gugg also issued a letter to vessel operators operating in the Port of San Francisco noting that the Coast Guard has seen an increase in the number of vessels experiencing propulsion losses and fuel-related equipment failures since the July 1, 2009 implementation of the CARB low sulfur requirements.⁸

⁵ United States Environmental Protection Agency, *Proposal to Designate an Emission Control Area for Nitrogen Oxides, Sulfur Oxides and Particulate Matter, Technical Support Document, Chapter 5*. April 2009.

⁶ Harbor Safety Committee of the San Francisco Bay Region, *Navigation Work Group Meeting Minutes*. August 12, 2009.

⁷ Harbor Safety Committee of the San Francisco Bay Region, *Navigation Work Group Meeting Minutes*. August 12, 2009.

⁸ United States Coast Guard, *Fuel Switching/Port of San Francisco*. Letter to Vessel Operators, November 2, 2009.

Additionally, in June 2009, the U.S. Coast Guard issued a Marine Safety Alert regarding propulsion loss from fuel switching.⁹ The Marine Safety Alert notes that some ships have experienced propulsion losses linked to fuel switching, including fuel oil incompatibility. The Coast Guard provided vessel owners and operators with an American Petroleum Institute paper that discusses problems that lead to propulsion loss while switching fuel.¹⁰

The new NOx standard also raises questions for vessel owners. For example, if an engine is certified at specified load levels, variable loads (such as harbor maneuvering) could result in short bursts of emissions that violate the new standards.

Despite these questions and concerns, EPA says the ECA is expected to yield significant health and welfare benefits by reducing ship-related adverse health impacts. Additionally, EPA claims that the reduction in health issues will result in monetized health benefits in 2020 to between \$47 and \$100 billion in 2006 U.S. dollars, assuming a 3 percent discount rate.

Future ECA Designations

The EPA is also investigating whether other areas of the United States and its territories may benefit from ECA designation. The agency is currently analyzing whether Puerto Rico and the U.S. Virgin Islands would benefit from ECA designation. Other areas for future consideration include the Pacific U.S. territories, smaller Hawaiian Islands, and Western Alaska. Should the EPA decide to pursue ECA designations for any or all of these areas, a separate proposal would be submitted to the IMO for approval.

For More Information

Additional information on the EPA's air emissions program for oceangoing vessels, including documents cited in this alert, can be found at: http://www.klgates.com/practices/vessel_discharge_resources/ and <http://www.epa.gov/otaq/oceanvessels.htm>.

⁹ United States Coast Guard, *Avoiding Propulsion Loss from Fuel Switching: American Petroleum Institute Technical Considerations*. Marine Safety Alert, June 16, 2009.

¹⁰ American Petroleum Institute, *Technical Considerations of Fuel Switching Practices*. June 3, 2009.

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