



Federal Marine Diesel Standards



- Federal marine diesel engine emission standards
 - Final Rule establishing emission standards published December 29, 1999 (64 FR 73301)
 - Rulemaking documents available at:
<http://www.epa.gov/otaq/marine.htm>
- Federal standards apply to new commercial engines
 - » Installed on US-flagged vessels
 - » At or above 37 kW, but less than 30 l/cyl
 - » Propulsion and auxiliary engines
 - » Exemption available for vessels used 75% or more of total operating time outside of US territory



Federal Marine Diesel Standards

■ Federal Standards

- Prior to effective dates of the federal standards, engine manufacturers are encouraged to voluntarily comply with the MARPOL Annex VI NO_x limits

U.S. EPA Emission Standards and Dates for Marine Diesel Engines > 37 kW

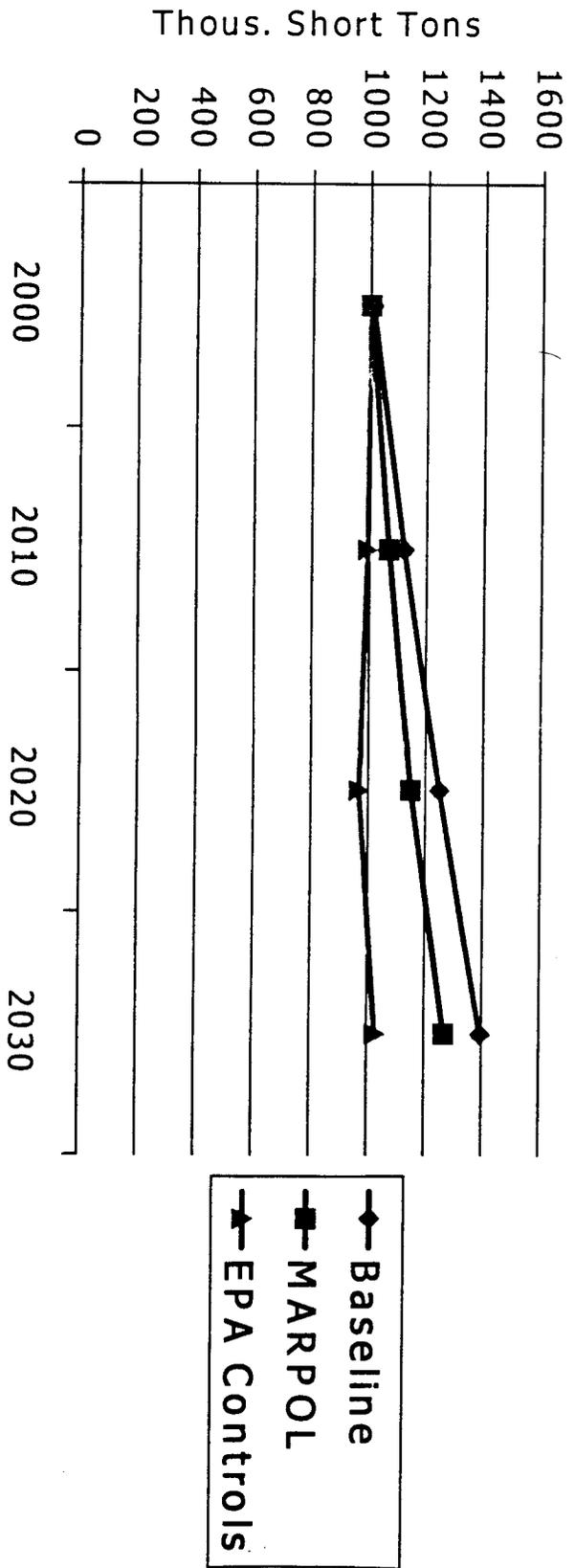
Category	Displacement	Starting Date	NO _x +HC (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)
1	disp. < 5.0 liters/cylinder	2004-7	7.2-7.5	0.20-0.40	5.0
2	disp. ≥ 5.0 liters/cylinder, < 30 liters/cylinder	2007	7.8-11.0	0.27-0.50	5.0
3	disp. ≥ 30 liters/cylinder	No standards finalized; engines subject to MARPOL Annex VI requirements			



Federal Marine Diesel Standards



Commercial CI Marine Engines Emission Projections - NOx

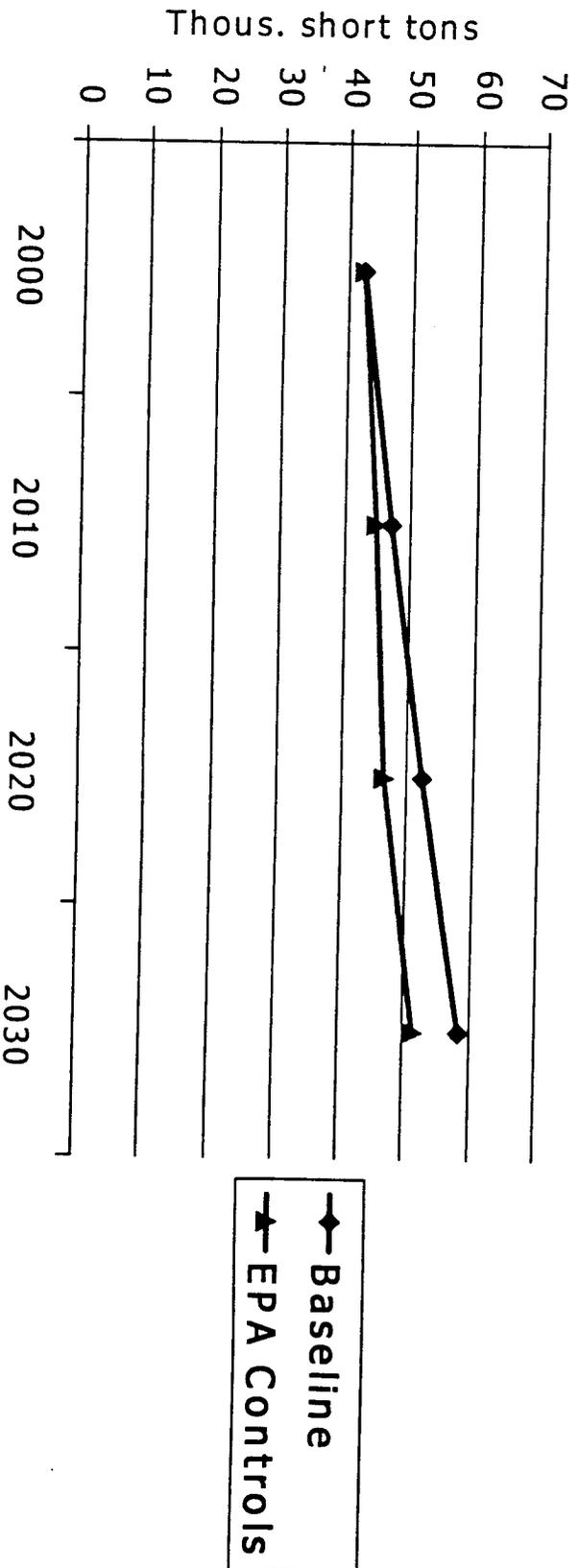




Federal Marine Diesel Standards



Commercial CI Marine Engines Emission Projections - PM





MARPOL Standards



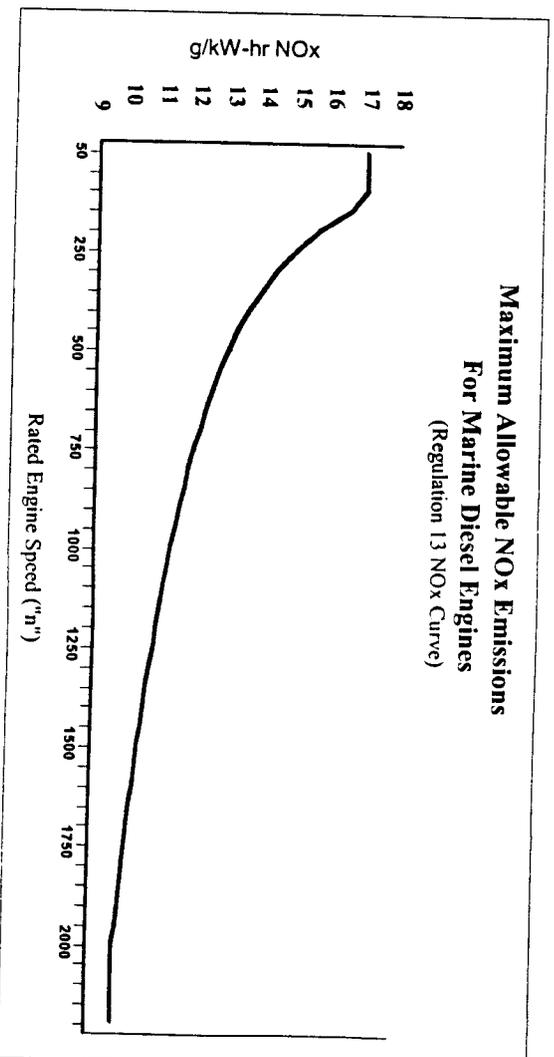
■ MARPOL

- Annex VI was adopted by IMO in 1997
- Standards are not yet in force internationally
 - » 3 countries have ratified (7 percent of world merchant tonnage)
 - » Need 15 countries with 50% of world merchant tonnage
- Annex includes regulations for
 - » Engine NOx levels
 - » Shipboard incinerators
 - » Fuel sulfur content and fuel quality
 - » Tanker vapor emission controls
 - » Ozone-depleting substances



MARPOL Standards

- Engine standards - NOx only
 - Applicable to engines > 130 kW, beginning 1/1/2000
- Fuel standards:
 - 45,000 ppm fuel sulfur content cap
 - 15,000 ppm fuel sulfur content limit for special control areas





Federal Category 3 Marine Standards

- EPA did not include Category 3 standards in 1999 rule
- We are currently preparing a proposal for these engines
 - NPRM: April 30, 2002; FRM: January 31, 2003
 - Must propose and take final action on NOx limits
 - We are also considering the appropriateness of
 - » Standards for other pollutants (PM, CO, HC)
 - » Fuel controls
 - » Application to foreign flag vessels
- <http://www.epa.gov/otaq/marine.htm>

Marine Fuel Standards

MARPOL 73/78 Annex VI includes:

Fuel sulfur cap of 45,000 ppm (4.5%)

Fuel sulfur cap of 15,000 ppm (1.5%) for "SO_x Emission Control Areas"

Currently the Baltic Sea and North Sea have been granted the SO_x Emission Control Area designation.

There is interest in looking into a SO_x Emission Control Area designation for the West Coast, possibly including Canada and Mexico.

- Bluewater Network has approached EPA and Environment Canada about supporting such an effort.
- EPA is open to investigating the issue to determine the benefits and costs of such a designation.
- A lower sulfur fuel would provide SO_x, PM and NO_x benefits.
- Current worldwide fuel sulfur content is estimated to be 2.7-2.8%.

The IMO would need to approve the SO_x Emission Control Area designation as an amendment to Annex VI. The proposal would need to address criteria such as:

- SO_x impacts on land and sea area under consideration, including ecosystems, water quality, and human health;
- relevant meteorological conditions;
- nature of ship traffic;
- description of current control measures ^{for} SO_x land-based sources