California Ocean-Going Ship Auxiliary Engine Regulation

Maritime Air Quality Technical Working Group
Long Beach, California
September 12, 2006

California Environmental Protection Agency
Air Resources Board

Overview

♦ Summary of Regulation
♦ Air Quality Benefits
♦ Status of Regulation
Summary of Regulation

Regulation Applies to Auxiliary Engines & Diesel-Electric Engines

Motor-Ship

- Main Engine for Propulsion (not covered)
- Auxiliary Engines for Electricity (covered)

Diesel-Electric

- Engines Provide Electricity for both Propulsion & Shipboard Uses (covered)
Regulation Applies Within 24 Nautical Miles of the California Coastline

- Retains the majority of health benefits
- Reduces the cost
- Utilizes international boundary

Emission Limit Based on Use of Cleaner Distillate Marine Fuels

- January 1, 2007 Emission Limit
  - Use marine gas oil
  - Use marine diesel oil with a 0.5% sulfur limit
  - Use equally effective emission control strategies

- January 1, 2010 Emission Limit
  - Use marine gas oil with a 0.1% sulfur limit
  - Use equally effective emission control strategies
  - Fuel supply review in 2008
Alternative Control of Emissions (ACE) Plan

- Operators may comply using alternative emission control strategies
- Must achieve equivalent or greater reductions
- Applicants may use fleet average emission reductions
- Special provision encourages the use of shore-side power
- Two public comment periods provided prior to final decision on approval or denial

Noncompliance Fee Provision

- Option to pay a noncompliance fee
  - Unexpected redirection to a California port
  - Inability to purchase complying distillate fuel
  - Fuel found to be noncompliant enroute to CA
  - Extension needed for vessel modifications
  - Vessel modifications needed on infrequent visitor
- Funds to be used for port air quality projects
## Noncompliance Fee Schedule

<table>
<thead>
<tr>
<th>Number of Port Visits</th>
<th>Diesel-Electric Vessels</th>
<th>Other Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$32,500</td>
<td>$13,000</td>
</tr>
<tr>
<td>2</td>
<td>$65,000</td>
<td>$26,000</td>
</tr>
<tr>
<td>3</td>
<td>$97,500</td>
<td>$39,000</td>
</tr>
<tr>
<td>4</td>
<td>$130,000</td>
<td>$52,000</td>
</tr>
<tr>
<td>5 or More</td>
<td>$162,500</td>
<td>$65,000</td>
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</tbody>
</table>

## Air Quality Benefits

![Air Quality Benefits Image](image-url)
Benefits of Distillate Fuel Compared to Heavy Fuel Oil

♦ Lower Sulfur Content = Lower SOx
  – 0.5% sulfur for distillate vs. 2.5% for HFO
♦ Lower Nitrogen Content = Lower NOx
  – Nitrogen in fuel can form NOx in exhaust
♦ Lower molecular weight HC’s and lower levels of metals = Less PM
  – Metals result in ash (inorganic) PM

Estimated Percent Emission Reductions*

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>2007</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>Diesel PM</td>
<td>75%</td>
<td>83%</td>
</tr>
<tr>
<td>NOx</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>SOx</td>
<td>80%</td>
<td>96%</td>
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</table>

* Emission reductions estimated from the use of 0.5% sulfur MGO in 2007, and 0.1% sulfur MGO in 2010, relative to the use of heavy fuel oil at 2.5% sulfur
Estimated Emissions of Diesel PM with and without the Regulation in the 24 nm Zone

<table>
<thead>
<tr>
<th>Year</th>
<th>Diesel PM (tons/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Without Regulation</td>
</tr>
<tr>
<td>2005</td>
<td>Without Regulation</td>
</tr>
<tr>
<td>2010</td>
<td>Without Regulation</td>
</tr>
<tr>
<td>2015</td>
<td>Without Regulation</td>
</tr>
<tr>
<td>2020</td>
<td>Without Regulation</td>
</tr>
<tr>
<td>2025</td>
<td>Without Regulation</td>
</tr>
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Status of Regulation
Timeline

♦ A “Final Statement of Reasons” responding to formal public comments expected to be submitted to the Office of Administrative Law (OAL) in October
♦ OAL has 30 working days to review
♦ If approved by OAL, regulation generally becomes law in 30 days
♦ Regulation available at: http://www.arb.ca.gov/marine
  – (see May 18, 2006 item)

Other Action Items

♦ ACE Guidelines to assist applicants interested in alternative control strategies
♦ Agreements with Ports to Collect Noncompliance Fees
♦ Enforcement Coordination with other Agencies
# ARB Contacts

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