Proposed Amendments to the Commercial Harbor Craft Regulation for Crew and Supply Vessels Workshop

Sacramento
May 14, 2009
California Environmental Protection Agency
Air Resources Board

Overview

♦ Background
♦ Crew and supply vessel proposed amendments
♦ Estimated emissions benefits
♦ Cost
♦ Funding opportunities
♦ Other proposed amendments
Commercial Harbor Craft Regulation

♦ Board approved in November 2007
♦ Became effective November 2008
♦ Operational and new engine requirements for all commercial harbor craft
♦ In-use engine requirements for ferries, excursions vessels, tugboats, and towboats

Health Risk Assessment

♦ Port POLA / POLB Health Risk Assessment
  – Commercial Harbor Craft third largest contributor to risk behind ocean going vessel hotelling and cargo handling equipment

♦ POLA / POLB CHC Emissions Cancer Risk
  – >200 cases per million risk (5,000 residents)
  – >10 cases per million risk (1.5 million residents)
  – Significant source of PM mortality
Crew and Supply Emissions are Small Portion of Statewide Harbor Craft Inventory

- Crew and Supply, 5%
- Ferry and Excursion, 32%
- Charter Fishing, 15%
- Commercial Fishing, 20%
- Tow, 4%
- Tug, 20%
- Other, 2%
- Pilot, 1%

2007 Statewide PM Emissions

Crew and Supply Vessels Comprise a Small Portion of Total Fleet

<table>
<thead>
<tr>
<th>District</th>
<th># of Vessels</th>
<th>C&amp;S</th>
<th>C&amp;S % of all CHC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All CHC</td>
<td>C&amp;S</td>
<td></td>
</tr>
<tr>
<td>Santa Barbara</td>
<td>183</td>
<td>13*</td>
<td>7%</td>
</tr>
<tr>
<td>Ventura</td>
<td>195</td>
<td>13*</td>
<td>7%</td>
</tr>
<tr>
<td>South Coast</td>
<td>750</td>
<td>20</td>
<td>3%</td>
</tr>
<tr>
<td>Bay Area</td>
<td>1,477</td>
<td>18</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>2,605</td>
<td>64</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Number of vessels operating in Santa Barbara and Ventura equally divided between them
Crew and Supply Vessel Engine Annual Hours are High

Average Crew and Supply Survey Results

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td># Vessels</td>
<td>64</td>
</tr>
<tr>
<td># Propulsion Engines</td>
<td>152</td>
</tr>
<tr>
<td>Average Horsepower</td>
<td>523</td>
</tr>
<tr>
<td>Average Annual Hours</td>
<td>2462</td>
</tr>
<tr>
<td># Auxiliary Engines</td>
<td>70</td>
</tr>
<tr>
<td>Average Horsepower</td>
<td>74</td>
</tr>
<tr>
<td>Average Annual Hours</td>
<td>3171</td>
</tr>
</tbody>
</table>

Crew and Supply are Significant Part of Santa Barbara and Ventura’s Harbor Craft Emissions

<table>
<thead>
<tr>
<th>District</th>
<th>All CHC (tons/year)</th>
<th>C&amp;S (tons/year)</th>
<th>C&amp;S % of All CHC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PM</td>
<td>NOx</td>
<td>PM</td>
</tr>
<tr>
<td>Santa Barbara</td>
<td>49</td>
<td>1,168</td>
<td>20</td>
</tr>
<tr>
<td>Ventura</td>
<td>51</td>
<td>1,206</td>
<td>20</td>
</tr>
<tr>
<td>South Coast</td>
<td>271</td>
<td>6,396</td>
<td>10.7</td>
</tr>
<tr>
<td>Bay Area</td>
<td>392</td>
<td>9,269</td>
<td>7.0</td>
</tr>
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</table>
Crew and Supply Largest Single Contributor to Santa Barbara and Ventura Harbor Craft Emissions

Santa Barbara and Ventura
CHC PM Emissions

Crew and Supply, 39%
Commercial Fishing, 21%
Ferry and Excursion, 19%
Charter Fishing, 13%
Tug, 5%
Pilot Vessels, 2%
Other, 1%

Local air districts permit of oil platforms include diesel engine emissions from associated crew and supply vessels
- Neither vessel or vessel engines are individually permitted or controlled

Operators may choose to reduce vessel emissions for mitigation credits
- Source tests may be required as part of agreement
Proposing to Add In-Use Engine Requirements for Crew and Supply

- Similar to those for ferries, excursion vessels, tugboats, and towboats
- Phased compliance schedule brings oldest, highest use engines into compliance first
- Requires unregulated and Tier 1 engines to meet U.S. EPA Tier 2 or Tier 3 standards
- Compliance methods, engine model year determination, extensions, and alternative compliance plan all consistent with original regulation

Compliance Methods Same as for Ferries, Excursion Vessels, Tugboats, and Towboats

- Replace with engine meeting current standard
- Demonstrate in-use engine meets standard
  - Tier 2 prior to Tier 3 effective date
  - Tier 3 when standard becomes effective
- Demonstrate in-use engine operates less than 300 hours annually
Same Methods for Determining Effective Engine Model Year

♦ Engine’s actual model year
♦ Engine’s actual model year +5
  – If a diesel emission control strategy is employed that reduces the PM or NOx emissions by >25%
♦ Engine Tier 1 Rebuild Model Year
  – If Tier 0 engine was rebuilt to meet Tier 1 standards prior to January 1, 2010
  – January 1, 2008 for previously regulated vessel types

Single Compliance Schedule for All Crew and Supply Vessel Engines

<table>
<thead>
<tr>
<th>Engine Hours</th>
<th>Model Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985 and earlier (&gt;1500 hours)</td>
<td>2011</td>
</tr>
<tr>
<td>1985 and earlier (&gt;300 - &lt;1500 hours)</td>
<td>2012</td>
</tr>
<tr>
<td>1986-1995 (&gt;1500 hours)</td>
<td>2013</td>
</tr>
<tr>
<td>1986-1995 (&gt;300 - &lt;1500 hours)</td>
<td>2014</td>
</tr>
<tr>
<td>1996-2000 (&gt;1500 hours)</td>
<td>2015</td>
</tr>
<tr>
<td>1996-2000 (&gt;300 - &lt;1500 hours)</td>
<td>2016</td>
</tr>
<tr>
<td>2001-2002 (&gt;300 hrs)</td>
<td>2017</td>
</tr>
<tr>
<td>2003 (&gt;300 hrs)</td>
<td>2018</td>
</tr>
<tr>
<td>2004 (&gt;300 hrs)</td>
<td>2019</td>
</tr>
<tr>
<td>2005 (&gt;300 hrs)</td>
<td>2020</td>
</tr>
<tr>
<td>2006 (&gt;300 hrs)</td>
<td>2021</td>
</tr>
<tr>
<td>2007 (&gt;300 hrs)</td>
<td>2022</td>
</tr>
</tbody>
</table>
Anticipated Crew and Supply Engines Required to Comply by Year

Engine Numbers Small Compared to Previously Regulated Vessel Categories
Estimated Emission Benefits and Costs

Anticipated Emissions Benefits

- Total emissions reductions from crew and supply vessel engines over life of the regulation
  - 224 tons PM
  - 4,200 tons NOx
Santa Barbara and Ventura Gain Greater Share of Emission Benefits

- Total emissions reductions from crew and supply vessel engines over life of the regulation in:
  - Santa Barbara/Ventura
    - PM 155 tons
    - NOx 3000 tons
  - South Coast
    - PM 35 tons
    - NOx 485 tons
  - Bay Area
    - PM 34 tons
    - NOx 720 tons

Baseline and Controlled Statewide Crew and Supply PM Emissions

![Graph showing baseline and controlled PM emissions from 2007 to 2025. The graph illustrates a steady decrease in emissions over the years, with controlled PM emissions consistently lower than baseline PM emissions.](image-url)
Baseline and Controlled Statewide Crew and Supply NOx Emissions

Baseline and Controlled Statewide NOx Emissions for All Harbor Craft
Baseline and Controlled Santa Barbara/Ventura NOx Emissions

Crew and Supply Emissions in SCAQMD Small Portion of Total

- Crew and supply vessel emissions:
  - 4% of South Coast commercial harbor craft emissions inventory and
  - 3% of vessels
- Accelerated South Coast compliance schedule would provide very little additional emissions reductions by 2014.
Baseline and Controlled South Coast NOx Emissions

Total Cost for Crew and Supply Vessel Engines

- $8.5 million total regulatory compliance cost
- $22.5 million total industry cost
Estimated Engine Replacement Costs

<table>
<thead>
<tr>
<th>Engine Category</th>
<th>Average Cost ($/hp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propulsion Engine</td>
<td>$270</td>
</tr>
<tr>
<td>Auxiliary Engine</td>
<td>$233</td>
</tr>
</tbody>
</table>

Crew and Supply Cost Effective Due to Large Percentage of Older Engines

<table>
<thead>
<tr>
<th>Cost Effectiveness</th>
<th>All Costs Attributed to PM ($/lb)</th>
<th>All Costs Attributed to NOx ($/ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Auxiliary Engine</td>
<td>Propulsion Engine</td>
</tr>
<tr>
<td>Ferry, Excursion, Tug, Tow</td>
<td>$77</td>
<td>$27</td>
</tr>
<tr>
<td>Crew and Supply</td>
<td>$28</td>
<td>$18</td>
</tr>
</tbody>
</table>

Funding Opportunities for Crew and Supply Vessels

♦ Require real, surplus, quantifiable, and enforceable reductions
♦ Carl Moyer Program
♦ Proposition 1B
  – Funding in specific trade corridors only:
    • Los Angeles/Inland Empire, Central Valley, Bay Area, and San Diego/Border
♦ Contact your local air pollution control district

Other Amendments
Other Amendments Crafted to Address Implementation Issues

- Availability of CARB diesel outside California
- Fishing vessels operating less than 300 annual hours as excursion
- Swing engines
- Clarifying amendments

Availability of CARB Diesel Fuel Outside California

- Vessels traveling to California from outside the State
  - If CARB diesel not available for fueling prior to entering Regulated California Waters, amendment would allow:
    - U.S. EPA on-road diesel
    - U.S. EPA nonroad diesel (after June 1, 2010)
    - Both 15 ppm sulfur fuels
- Vessel operators must retain fuel records showing no availability of CARB diesel fuel
Fishing Vessels Operating Engines Less than 300 Hours Annually As Excursion

- Provide exemption for fishing vessels operating less than 300 hours/year as excursion vessel
- Excursion vessels operating less than 300 hours per year are exempt from in-use engine requirements

300 Hour Low Use Exemption to Apply to Hours Operating in Regulated Category

- Add language that any engine operating a total of 300 or more hours as a ferry, excursion vessel, tugboat, towboat, crew, or supply boat subject to in-use engine requirements
- Remove use of term “multipurpose vessel”
Use of Swing Engines

♦ Some fleets keep a swing engine to rotate in and out of vessels to reduce maintenance down time
♦ Amend to require reporting and record keeping for swing engines
♦ Subject to in-use engine standards

Other Proposed Amendments to the CHC Regulation

♦ Section (c)(7)(C) clarifying change
  – Section addresses applicability to portable engines
  – Replace “vessel engine” with “portable engine”
♦ Refine definition of temporary emergency/recue vessel
♦ Added required date to submit an Alternative Compliance of Emissions (ACE)
  – Feb. 28 of year the first ACE impacted engine is required to comply
♦ Clarify reporting requirement for vessel brought into California
Remanufactured Engines

- Some operator’s practice has been to trade engine in for a remanufactured engine rather than rebuilding engine in place
  - Reduces out-of-service time
  - Some remanufactured engines updated to be cleaner than original engine
- No prohibition on rebuilding engines
- But replacement of engine allows only engines meeting the current model year standard engine
- Should reg be amended to allow this practice?

Questions
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