Proposed Amendments to the Commercial Harbor Craft Regulation Workshop

Sacramento
February 16, 2010
California Environmental Protection Agency
Air Resources Board

Overview
♦ Status of Regulation
♦ Proposed Amendments
♦ Emissions Inventory and Benefits
♦ Costs
♦ Questions
Status of Regulation

♦ Board approved in November 2007
♦ Became effective November 2008
♦ Requirements include:
  – Operational and new engine requirements for all diesel engines on commercial harbor craft
  – In-use engine requirements for ferries, excursions vessels, tugboats, and towboats
  – Recordkeeping and initial reporting

Commercial Harbor Craft Regulation

♦ Board approved in November 2007
♦ Became effective November 2008
♦ Requirements include:
  – Operational and new engine requirements for all diesel engines on commercial harbor craft
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  – Recordkeeping and initial reporting
Implementation Status

♦ Deadline for initial reports – March 31, 2009
♦ Report must be updated annually and maintained on vessel or central dockside location
♦ Requirements currently being enforced:
  – fuel use
  – reporting and recordkeeping

Proposed Amendments
Overview of Proposed Amendments

♦ Add in-use engine requirements for:
  – Crew and supply vessels
  – Barges and dredges
♦ Address implementation issues
♦ Clarify language

Updated Crew and Supply Vessel Survey Conducted

♦ Higher response rate
♦ More complete data
♦ Updated inventory with new crew and supply vessel population and activity level
♦ Supported by reporting data
Crew and Supply Vessels 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>
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</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>
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Barge and Dredge Engines

- Very large auxiliary engines that operate close to shore
- Recent change in PERP regulation allows marine engines (primarily on barges and dredges) to be registered in PERP
  - Previously subject to Portable Engine ATCM
  - Now subject to Harbor Craft Regulation
- Current regulation has no in-use requirements for barges and dredges
- Some barge and dredge engines are currently uncontrolled if outside PERP or local permits
- In-use requirements needed for Statewide consistency
In-Use Engine Requirements

- Phased compliance schedules for crew and supply vessels and barges and dredges
  - Brings oldest, highest use engines into compliance first
- Removes unregulated and Tier 1 engines
- Compliance methods, engine model year determination, extensions, and alternative compliance plan all consistent with original regulation

<table>
<thead>
<tr>
<th>Engine Model Year</th>
<th>Total Annual Hours of Operation</th>
<th>Compliance Date</th>
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</thead>
<tbody>
<tr>
<td>1985 and earlier</td>
<td>&gt;1500 hours</td>
<td>12/31/2011</td>
</tr>
<tr>
<td>1985 and earlier</td>
<td>&gt;300 - &lt;1500 hours</td>
<td>12/31/2012</td>
</tr>
<tr>
<td>1986 - 1995</td>
<td>&gt;1500 hours</td>
<td>12/31/2013</td>
</tr>
<tr>
<td>1986 - 1995</td>
<td>&gt;300 - &lt;1500 hours</td>
<td>12/31/2014</td>
</tr>
<tr>
<td>1996 - 2000</td>
<td>&gt;1500 hours</td>
<td>12/31/2015</td>
</tr>
<tr>
<td>1996 - 2000</td>
<td>&gt;300 - &lt;1500 hours</td>
<td>12/31/2016</td>
</tr>
<tr>
<td>2001 - 2002</td>
<td>&gt;300 hrs</td>
<td>12/31/2017</td>
</tr>
<tr>
<td>2003</td>
<td>&gt;300 hrs</td>
<td>12/31/2018</td>
</tr>
<tr>
<td>2004</td>
<td>&gt;300 hrs</td>
<td>12/31/2019</td>
</tr>
<tr>
<td>2005</td>
<td>&gt;300 hrs</td>
<td>12/31/2020</td>
</tr>
<tr>
<td>2006</td>
<td>&gt;300 hrs</td>
<td>12/31/2021</td>
</tr>
<tr>
<td>2007</td>
<td>&gt;300 hrs</td>
<td>12/31/2022</td>
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### Compliance Schedule for Barge and Dredge Vessel Engines

<table>
<thead>
<tr>
<th>Engine Model Year</th>
<th>Total Annual Hours of Operation</th>
<th>Compliance Date</th>
</tr>
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<tbody>
<tr>
<td>1975 and earlier</td>
<td>&gt;80</td>
<td>12/31/2011</td>
</tr>
<tr>
<td>1976 - 1980</td>
<td>&gt;80</td>
<td>12/31/2012</td>
</tr>
<tr>
<td>1981 - 1985</td>
<td>&gt;80</td>
<td>12/31/2013</td>
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<td>1986 - 1990</td>
<td>&gt;80</td>
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<tr>
<td>2000 - 2001</td>
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</tr>
<tr>
<td>2002</td>
<td>&gt;80</td>
<td>12/31/2018</td>
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<td>&gt;80</td>
<td>12/31/2019</td>
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<tr>
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<td>12/31/2020</td>
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<tr>
<td>2005</td>
<td>&gt;80</td>
<td>12/31/2021</td>
</tr>
<tr>
<td>2006</td>
<td>&gt;80</td>
<td>12/31/2022</td>
</tr>
</tbody>
</table>

### Additional Amendments Affecting Barge and Dredges

- Remove exemption for engines in PERP or subject to local air district permit prior to January 1, 2009
  - Can still be registered in PERP
- Low use exemption set to 80 hours annually
  - Consistent with PERP
Additional 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 operator must retain records documenting fuel purchase
Disposition of Engines Brought into Compliance

♦ Allow use of an engine removed prior to compliance date to replace an older, dirtier engine

♦ Engines replaced must:
  – Be within the same fleet
  – Original compliance date of older engine remains in effect

♦ Moyer program engines not eligible

Replacement Engine Exemption

♦ Applies to engine replacement due to engine failure on in-use vessel

♦ Allows replacement with engine not meeting current standards if:
  – Demonstrate that a compliant engine meeting required physical or performance characteristics unavailable
  – Requires evaluation of current tier and each previous engine tier
  – Must obtain ARB approval
Allow Use of Off-Road Engines

- Applies to auxiliary engines only
- Certified to current off-road engine standards
- Must meet federal requirements for use of an off-road engine in marine applications

Modification of Low-Use Hours

- In-use requirements apply when a total of 300 or more hours of operation occur annually in any of the regulated vessel categories
- Apply 80 hour low-use for barge and dredge engines to be consistent with PERP
- Remove term “multipurpose vessel”
Other Proposed Amendments to the CHC Regulation

♦ Section (b)(2) - Clarify section addressing applicability to engines subject to multiple regulations
  – Add definition for engine permanently affixed to a vessel
♦ Add 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
♦ Clarify definition of temporary emergency/rescue vessel

Inventory, Emissions, and Benefits of Current Proposal
Crew and Supply Emissions are Small Portion of Statewide Harbor Craft Inventory

2007 Statewide PM Emissions

Estimated Emissions Benefits from Crew and Supply

- Total emissions reductions from crew and supply vessel engines over life of the regulation
  - 220 tons PM
  - 3,900 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 116 tons
    - NOx 2300 tons
  - South Coast
    - PM 96 tons
    - NOx 1500 tons
  - Bay Area
    - PM 8 tons
    - NOx 130 tons

Statewide Crew & Supply Vessel PM2.5 Emissions: Baseline vs. Controlled

![Graph showing PM2.5 emissions comparison over calendar years from 2007 to 2025. The graph indicates a decrease in emissions from baseline to controlled emissions over time.]
Statewide Crew & Supply Vessel NOx Emissions: Baseline vs. Controlled

Barge and Dredge Vessel Engine Overview

<table>
<thead>
<tr>
<th></th>
<th>Barge</th>
<th>Dredge</th>
</tr>
</thead>
<tbody>
<tr>
<td># Vessels</td>
<td>88</td>
<td>18</td>
</tr>
<tr>
<td># Auxiliary Engines</td>
<td>314</td>
<td>81</td>
</tr>
<tr>
<td>Average Horsepower</td>
<td>350</td>
<td>800</td>
</tr>
<tr>
<td>Average Annual Hours</td>
<td>500</td>
<td>1000</td>
</tr>
<tr>
<td># Propulsion Engines</td>
<td>*</td>
<td>4</td>
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<tr>
<td>Average Horsepower</td>
<td>*</td>
<td>3500</td>
</tr>
<tr>
<td>Average Annual Hours</td>
<td>*</td>
<td>N/A</td>
</tr>
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</table>

* Not Reported
Anticipated Barge and Dredge Emissions Benefits

- Total emissions reductions from barge and dredge engines over life of the regulation
  - 90 tons PM
  - 1400 tons NOx

Statewide Barge & Dredge PM2.5 Emissions: Baseline vs. Controlled

[Graph showing emissions reduction over time from 2007 to 2025, with a decrease in emissions from 0.05 tons/day to 0.00 tons/day for both Baseline and Controlled scenarios.]
Statewide Barge & Dredge NOx Emissions: Baseline vs. Controlled

Contributes to Important Health Risk Reductions

- Cancer risk levels
- Non-cancer risk levels
  - Premature deaths, asthma, work loss days
Total Costs for Added In-Use Engines

♦ Crew and supply vessels:
  – $9.5 million total regulatory compliance cost
  – $19.8 million total industry cost

♦ Barge and dredge vessels:
  – $5.6 million total regulatory compliance cost
  – $26.5 million total industry cost
Costs for Proposed Vessel Engines

Costs from:
- POLA PCAC China Shipping Settlement Funding
- Industry
- Vessel owners

<table>
<thead>
<tr>
<th>Engine Category</th>
<th>Cost ($/hp)</th>
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<tbody>
<tr>
<td></td>
<td>Crew and Supply</td>
</tr>
<tr>
<td>Propulsion Engine</td>
<td>214</td>
</tr>
<tr>
<td>Auxiliary Engine</td>
<td>508</td>
</tr>
</tbody>
</table>
Crew and Supply Cost Effective Due to Large Percentage of Older Engines

Summary of Average of Cost Effectiveness

<table>
<thead>
<tr>
<th></th>
<th>Auxiliary Engine</th>
<th>Propulsion Engine</th>
<th>Overall</th>
</tr>
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<tbody>
<tr>
<td>Ferry, Excursion, Tug, Tow</td>
<td>$77</td>
<td>$27</td>
<td>$28</td>
</tr>
<tr>
<td>Crew and Supply</td>
<td>$58</td>
<td>$25</td>
<td>$27</td>
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<tr>
<td>Barge and Dredge</td>
<td>$40</td>
<td>$40</td>
<td>$40</td>
</tr>
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All Costs Attributed to Nox ($/ton)

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<th>Propulsion Engine</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferry, Excursion, Tug, Tow</td>
<td>$11,818</td>
<td>$3,370</td>
<td>$3,560</td>
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<tr>
<td>Crew and Supply</td>
<td>$6,911</td>
<td>$2,668</td>
<td>$2,937</td>
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<tr>
<td>Barge and Dredge</td>
<td>$4,790</td>
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Questions
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