Commercial Harbor Craft Proposed Regulation Workshop
Sacramento
September 19, 2006

California Environmental Protection Agency
Air Resources Board

Background

♦ Reduce emissions mainly through the use of engine repowers and retrofits.
♦ First priority – Near shore impacts
♦ Fulfill Goods Movement Goals and make progress on Diesel Risk Reduction Plan commitment
Commercial Harbor Craft Goods Movement Emission Reduction Plan Goals

♦ 2010 -25%
♦ 2015 -30%
♦ 2020 -40%

Both PM and NOx reductions

Two Step Process

♦ Step 1: Repower
  – Tier 0 to Tier II
  – Tier I to Tier III

♦ Step 2: Future
  – Element to reduce NOx and PM further
Commercial Harbor Craft Vessel Types

- Includes many types of vessels including:
  - Tug/Tow
  - Ferries
  - Fishing Vessels
    - Commercial Fishing
    - Passenger Fishing
  - Crew, Supply, Pilot, Work, and Other Vessels

Marine Engine Standards

- Tier 0 Engines are unregulated
- U.S. EPA has established Tiered Standards
- Tier I and Tier II
  - Vary by engine displacement and model year
- Tier III / IV(?) are not yet promulgated
Commercial Harbor Craft
Proposed Regulation
Overview

- Separated Non-fishing and Fishing Vessels
- Focus on Non-fishing Emission Reductions
- Option of an Alternative Compliance Plan
- Targeting Old, High Use Engines First
- On-going Engine Emission Testing To Support Regulation
- Scheduled for Board Consideration Feb. ‘07

Exemptions

- Recreation Vessels
- Ocean Going Vessels
- Historic Vessels
- Low Use (Propulsion and Auxiliary)
- Engines Using Alternative Fuel Only
- Military Tactical Support Vessels
New Engines and Vessels

- Fishing and Non-fishing
- Must meet U.S. EPA Marine Emission Standards Applicable on the purchase date.

Existing Non-Fishing Vessel Overview

- Current Population mainly Tier 0 engines
- Proposed Compliance Dates (2008-2014)
  - Repower with Current Certified Engine or,
  - Documented Equivalent Emissions or,
  - Alternative Compliance Plan
Non-Fishing Vessels

Compliance Dates 2008 - 2014

Existing Engine

Replace Engine

Document Equivalency

Alternative Compliance Plan

Existing Non-Fishing Vessel Compliance Dates

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Existing Fishing Vessel Overview

- Typically Tier 0 Engines
- Proposed Compliance Dates (2011-2018)
- Targeting a 25% PM Reduction fleet wide
- Potential Compliance Options
  - Minimum Level 1 Emission Control or,
  - Certified Engine
- Retain opportunity for Carl Moyer funds
  - Additional PM, NOx, and other emission reductions

Fishing Vessels

Existing Engine

- Level 1 Control Device
- Document Level 1 Equivalency
- Certified Engine or Equivalent
- Alternative Compliance Plan

Compliance Dates 2011 - 2018
Existing Fishing Vessel Compliance Dates

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Alternative Compliance Plan

- Only harbor craft under direct control of the owner/operator per port
- Operators may comply using alternative emission control strategies.
- Must achieve equivalent or greater reductions
- Applications include a public review process
Potential Issues

- Economic Impacts
- Stringency and timing of new U.S. EPA engine standards
- Limited Strategies Available
- Technical Feasibility

Outstanding Items

- Compliance Timelines
- Low Use Exemptions
- Applicability with other ATCM / Regulations
- Tier I Rebuilds
- Additional Requirements for Higher Use Vessels
Commercial Harbor Craft Team
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Commercial Harbor Craft Cost Estimates

- Separated Non-fishing and Fishing Vessels
- Estimated Costs for Engine Replacement and Exhaust Retrofit

Non-Fishing Vessel Costs

Replace Engines with Tier II Engines
- Carl Moyer and Engine Manufacturers Data for Propulsion Engines = $222/hp
  - Useful Life of ~ 18 years
- Carl Moyer Data for Auxiliary Engines = $248/hp
  - Useful Life of ~ 14 years
- Investigating any Additional Costs for Tier III Engines
Non-Fishing Propulsion Replacement Engine Costs

Combined Engine, Gears, and Installation Costs

\[ y = 222x \]
\[ R^2 = 0.8987 \]

Non-Fishing Auxiliary Replacement Engine Costs

Marine Auxiliary Engine Replacement Costs

\[ y = 247.91x \]
\[ R^2 = 0.9342 \]
Fishing Vessel Overview

Targeting a 25% PM Reduction Fleet Wide using a Level 1 Type Emission Control

♦ Estimating a DOC = $11/hp
  ♦ Useful Life ~ 5 years