

Regulation for Commercial Harbor Craft



Continuation of Board Hearing

November 15, 2007



California Environmental Protection Agency

Air Resources Board

Overview

- ◆ Proposed Harbor Craft Regulation
- ◆ Questions and staff analysis
- ◆ Summary of staff analysis



Proposed Commercial Harbor Craft Regulation Overview



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Key Elements of Proposal

- ◆ Existing ferries, excursion vessels, tugboats, and towboats required to replace older engines with new certified engines
- ◆ New vessels and replacement engines must install new certified engines
- ◆ Monitoring, recordkeeping, and reporting requirements

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October Board Hearing Questions and Staff Analysis



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Should Proposal be Modified?

- ◆ Should replacement of Tier 0 engines be accelerated?
- ◆ Should replacement of ferry Tier 0 engines be accelerated?
- ◆ How do we recognize early investment in Tier 1 engines?
- ◆ Is more flexibility needed for owners required to repower multiple vessels in single year?

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Accelerate Replacement of Tier 0 Engines

- ◆ Three options:
 - Accelerate replacement of Tier 0 engines in entire State to South Coast schedule
 - Accelerate replacement of Tier 0 engines statewide, but on a slower schedule than South Coast
 - Accelerate replacement of Tier 0 ferry engines

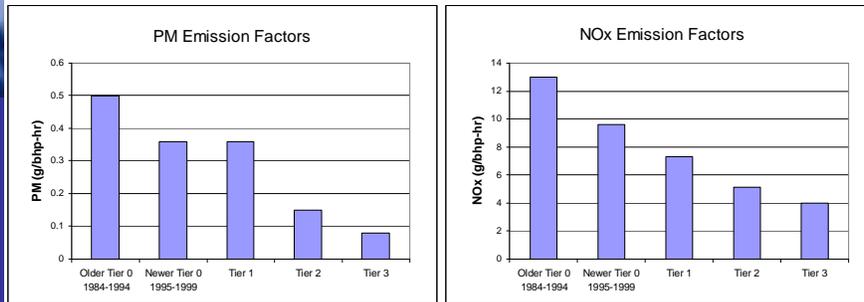
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Factors Considered

- ◆ Tier 3 PM standard 50% cleaner than Tier 2
- ◆ Tier 3 NOx standard 20% cleaner than Tier 2
- ◆ Later model (1995-1999) Tier 0 engines are cleaner (25-30%) than older Tier 0
- ◆ Installation capacity for repower limited
- ◆ As schedule compacts, more owners have to repower multiple vessels in same year
- ◆ Recognition of early investment in Tier 1

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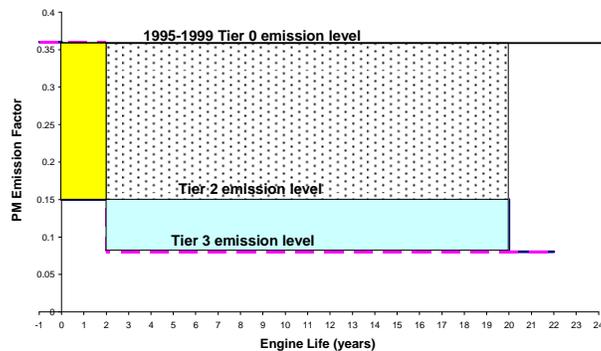
Tier 3 Engines Emit 50% Less PM than Tier 2



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Tier 3 Engines Provide 25% Greater PM Benefit and 20% Greater NOx Benefit

Category 1 Engines
(90% of All CHC engines)



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Accelerate Statewide Schedule

- ◆ Tier 0 engines replaced by Tier 2 instead of Tier 3
 - Lose 25% of Tier 3 PM reductions over engine life, 20% of Tier 3 NOx reductions
- ◆ Strains or exceeds repower capacity in several years
- ◆ More operators have to repower multiple vessels in same year
- ◆ Net benefit of rule is less

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Accelerate Replacement of Tier 0 Ferry Engines

- ◆ Accelerate replacement of 1996-1999 MY ferry engines to 2014
- ◆ Still ensures newer Tier 0 engines will be replaced with Tier 3 engines
- ◆ Maintains minimum 15 year life outside of South Coast
- ◆ Could accelerate reductions by 1 to 2 years with no loss of long term benefits
- ◆ Estimate <10 ferries impacted

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Multiple Vessel Compliance in Single Year

- ◆ Current proposed regulation provides flexibility for vessels with compliance dates 2012 and beyond
 - Alternative Control of Emissions
 - Use funding options for early reductions
- ◆ However, vessels with early compliance dates (2009-2010) have little opportunity for using this flexibility

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Potential Flexibility Option

- ◆ Allow phased compliance for fleets with multiple vessels requiring compliance in 2009 and 2010
- ◆ Minimum of 25% each year if 2009 compliance date
- ◆ Minimum 33% each year if 2010 compliance date
- ◆ All repowers to be completed by 2013

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Other Questions Posed by Board Members

- ◆ What funding opportunities are available for excursion vessels?
- ◆ What about small fleet economic impacts?
- ◆ Any new information on ferry aftertreatment technology?
- ◆ What is impact on greenhouse gas emissions?

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Excursion Vessel Funding Opportunities

- ◆ Typical excursion vessel engine replacement qualifies under Moyer cost-effectiveness criteria
- ◆ Moyer Program is over subscribed
- ◆ Ferry and tug engine replacements more cost-effective

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Small Fleet Economics

- ◆ Single vessel owners:
 - 32% of ferries/excursion vessels
 - 10% of tugboat vessels
 - 37% of towboat vessels
- ◆ No clear size cutoff that would preserve most of the emission reduction
- ◆ Excursion vessel likely to have greater economic impact than other vessels
- ◆ Estimate 5 to 10% increase in ticket price needed to cover the cost of compliance

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Ferry Aftertreatment Technologies

- ◆ Staff re-evaluated available data
- ◆ European experience
 - SCR on large ferries – ocean going vessel size
 - SCR on one “fast ferry” – seeking additional information
- ◆ United States experience
 - New York Staten Island Ferry – large ferry
 - Blue and Gold Ferry Auxiliary Engines DPF
 - New York private ferry fleet experience

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Impact on Greenhouse Gas Emissions

- ◆ Small reduction due to accelerated engine replacement
- ◆ Small reduction in CO₂ due to improved efficiency of new engines without aftertreatment (~1% reduction)
 - About 0.007 Million tons

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Summary of Staff Analysis

- ◆ Accelerating statewide schedule possible, but would strain capacity and forego emission reductions
- ◆ Opportunity to accelerate Tier 0 ferry engine replacement without loss of long term benefits
- ◆ More flexibility for multi-vessel compliance in first two years (2009 & 2010) is needed

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