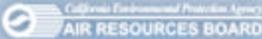




**Public Workshop to Discuss a  
Draft Proposal to  
Reduce Emissions from  
Ship Auxiliary Engines**

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Sacramento, California  
November 10, 2004



## Outline

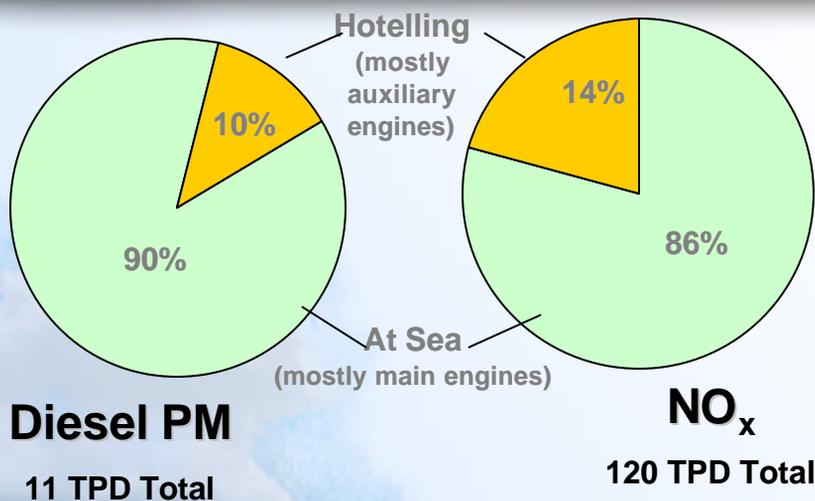
- Need to reduce auxiliary engine emissions
- Draft regulatory proposal
- Discussion items
- Next steps

## Need to Reduce Ship Auxiliary Engine Emissions

- Large and growing source of emissions
- SIP commitments:
  - 25-40% emission reduction from ships in 2010
- Diesel Risk Reduction Plan
  - 75% reduction in diesel PM in 2010, 85% in 2020
- Governor's Action Plan
  - 50% reduction in overall emissions by 2010
- Reduce diesel PM risk in communities near ports and shipping lanes

## Auxiliary Engines are an Important Element of Ships Emissions

ARB Emissions Inventory: 2003 Statewide Diesel PM and NO<sub>x</sub> Emissions



## Draft Proposal

- Only applies to auxiliary engines on oceangoing ships
  - Excludes most main engines, boilers, & gas turbines
- Does not apply to ships that only pass through Ca Coastal Waters
- Earlier proposal released April '04

## California Coastal Waters



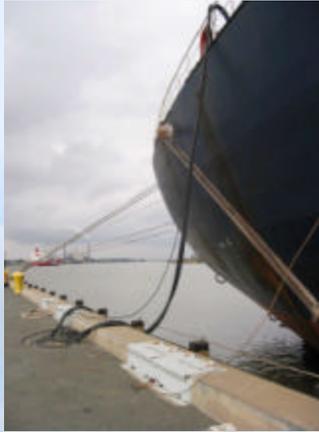
## Draft Proposal

- Step 1: Cleaner fuels for all vessels
  - 0.2% sulfur MGO in 2006
  - 0.1% sulfur MGO in 2008
- Alternative Compliance Plan
  - Voluntary option in lieu of cleaner fuel
  - Submit ACP for prior approval

## Draft Proposal

- Step 2: Further reductions from frequent visitors (5 visits/yr)
  - Must submit “Vessel Emission Reduction Plan”
  - Plan must achieve additional 50% reduction in both PM & NO<sub>x</sub> by 2010
  - Plans may average reductions from different engines and vessels

## Example of Potential Control Technology: Shore-side Power



## Additional Examples of Potential Control Technologies

- Selective catalytic reduction (SCR)
- Emulsified fuels
- Lower sulfur bunker fuel or distillate fuels in main engine
- Retrofit of modified fuel injectors
- Operational controls
- Oxidation catalysts (if low S fuel used)
- Cylinder lube oil control in main engine

## Benefits of Draft Proposal

- Part 1: Low sulfur MGO
  - 63% PM reduction, 6-10% NOx
  - Compared to HFO fueled engines
- Part 2: Further reductions from “frequent visitors”
  - 50% NOx and PM reduction for subject vessels beyond Part 1

## Discussion Item: Low Sulfur MGO

- Availability of low sulfur MGO at ports worldwide
- DNV Petrol Services data: Average MGO sulfur levels range from about 0.1% to 1% depending on country
- Two-tiered versus single tier

## Discussion Item: Frequent Visitor Provisions

- Definition of “frequent visitor” - How many visits?
- Should provisions be triggered by number of visits in previous or current year?
- Alternative triggers: time at CA ports, kW-hrs or emissions?

## Discussion Item: Provisions for Flexibility

- How much flexibility?
  - Ship-wide?
  - Fleet-wide?
  - Inter-company?
  - Emission reduction targets?

## Next Steps

- Ship Survey mail out in Dec. 2004
- Scheduled for Board Hearing in fourth quarter 2005
- Expect additional workshops prior to Board Hearing