Future Regulatory Plans for Ocean-going Vessels

- Vessel Speed Reduction Regulation
- Main Engine Fuel Regulation
- Sulfur Emission Control Area (SECA)
- Cleaner Vessels
- Cold Ironing
- Incineration
Current Vessel Speed Reduction MOU

- Initiated in 2001
- Voluntary
- NOx reduction
- Air Quality Compliance Zone
- Applicable to POLA and POLB

Vessel Speed Reduction Regulation

- Considering expanding zone
- Possible speed limit: 12 knots
- Region affected: POLA, POLB, and possibly other CA ports
- Emission Reductions: NOx and potentially other pollutants
Main Engine Fuel Regulation

- Use of low sulfur distillate fuel (MGO)
- Applicability: 24 nautical miles or more off CA coastline
- Staff will perform a fuel availability analysis
- Tentative Implementation Date: Jan. 2010
- Potential emissions reductions relative to use of heavy fuel oil:
  - 75% reduction of diesel PM and SOx
  - 6% reduction of NOx

SOx Emission Control Area (SECA) or Alternative

- Average sulfur content in heavy fuel oil is now 25,000 ppm (2.5%)
- A SECA caps fuel sulfur at 15,000 ppm (1.5%)
- ARB supporting U.S. EPA by providing technical support
- ARB is seeking 5,000 ppm (0.5%) sulfur or less by 2015
Cleaner Vessels: Cleaner Engines

Step 1: New and rebuilt engines, starting in 2010
- 30% reduction of PM*
- 30% reduction of NOx*

Step 2: New engines, starting in 2015
- 60% reduction of PM*
- 90% reduction of NOx*

*Reductions from current IMO standards

Cleaner Vessels: Potential Technology

- Low sulfur fuel
- Slide Valves
- Water / fuel oil emulsion
- Saturated Air Motor / Humid Air Motor
- Exhaust Gas Recirculation (EGR)
- Selective Catalytic Reduction (SCR)
- Reduced cylinder lube oil consumption
Cleaner Vessels:
Targets for Cleaner Vessel Visits

- Strategy calls for increasing percentage of ship visits by vessels using cleaner technology

<table>
<thead>
<tr>
<th>Ship Visits by Year</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
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<tbody>
<tr>
<td>30% Lower Emissions</td>
<td>20%</td>
<td>50%</td>
<td>40%</td>
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<tr>
<td>60% less PM, 90% less NOx</td>
<td>--</td>
<td>25%</td>
<td>50%</td>
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