

Maritime Air Quality Technical Working Group



**Focus on
Cleaner Fuels**

December 3, 2003

California Environmental Protection Agency



Air Resources Board

California's Strategy for Marine Measures

- **New Engine Standards**
 - Encourage USEPA and the IMO to adopt lower standards for NO_x & PM
- **Clean up the In-Use Fleet**
 - Retrofit Controls, Cleaner fuels, Operational Controls, Cold Ironing
- **Port-Specific Programs**
 - Additional controls for land-based sources



Cleaner Fuels Provide Opportunity for Emission Reductions

- **Provide immediate benefits**
- **Result in criteria and toxic emission reductions**
 - **NO_x, SO_x, and Diesel PM**
- **Enable advanced control technologies**

Today's Objectives

- **Outline ideas for clean fuels**
- **Initiate dialogue**
- **Identify areas for further investigation**

Cleaner Fuel Opportunities



- CARB Diesel:**
Harbor craft
- ~10-25% PM Redn.
 - ~6% NOx Reduction
 - Greater use of add-on controls



- Marine Distillate:**
Ships at Dockside
(auxiliary engines)
- ~60% PM Reduction
 - ~6-10% NOx Redn.
 - ~90% SOx Reduction



- Lower Sulfur Marine Bunker Fuel:**
Oceangoing ships at sea
(main engines)
- ~20% PM Reduction
 - ~40% SOx Reduction



Cleaner Fuels for Harbor Craft

Harbor Craft Use CARB On-Road Diesel Regulatory Concept

- Require CARB diesel or verified alternative fuel for harbor craft
 - tugboats, fishing boats, crew boats, passenger ferries, work boats, charter boats
- California ferries already use CARB diesel
- Encourage western states & Canada to adopt similar requirements



Harbor Craft Use CARB On-Road Diesel Issues for Investigation

- Engine compatibility
- Flash point requirements
- Cost impacts
- Fuel availability/infrastructure
- Out of state fueling



Cleaner Fuels for Auxiliary Engines in Oceangoing Ships

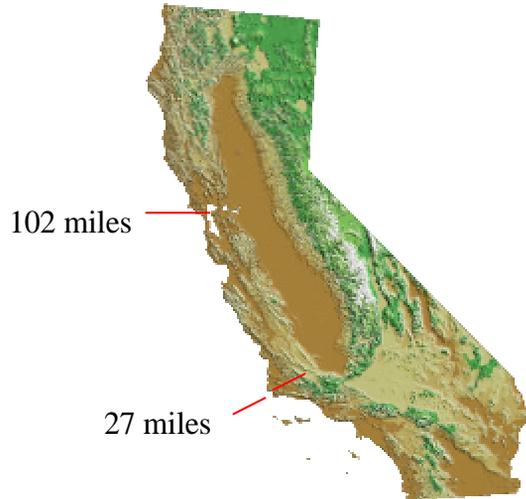


Cleaner Fuels for Auxiliary Engines in Oceangoing Ships

Regulatory Concepts

- **On-board generators burn cleaner fuel at dockside or in CCW**
- **MGO with sulfur cap or EPA/CARB on-road diesel**
- **Allow cold ironing or add-on controls as an alternative**
- **Special provisions for “frequent flyers”**
- **Encourage western states/Canada to adopt similar program**

California Coastal Waters



Ships at Dockside Use Distillate Fuels EU Proposal

- Fuel sulfur limited to 0.2 percent sulfur (0.1% sulfur in 2008)
- Would apply to ships at dockside, and in inland waterways
- Estimate reductions of 60% PM and 6% NOx



Ships at Dockside Use Distillate Fuels Issues for Investigation

- **Cost impacts**
- **Fuel switching procedures**
- **Additional tanks and piping needed**
- **Engine compatibility**
- **Availability of cleaner fuels**
- **Safety issues/flash point**
- **Cost benefits of cold-ironing for frequent flyers**
- **Port impacts**



Cleaner Fuels for Oceangoing Ship Propulsion Engines

Ships use lower sulfur bunker fuel on West Coast Regulatory Concepts

- **IMO process -- Create Sulfur Emission Control Area (SECA)**
- **West Coast Cooperative Effort**



Ships use lower sulfur bunker fuel on West Coast Issues for Investigation

- **Process for designation**
- **Demonstration of need**
- **Cost impacts**
- **Technical Feasibility**
- **Availability of 1.5% sulfur fuel**



Timelines

- **Clean Fuels for Harbor Craft**
 - Adopt late 2004/early 2005
- **Auxiliary Engines**
 - Feasibility study complete in 2004
 - Adopt requirement by 2005-6
- **SO_x Emission Control Area Designation**
 - Work with U.S. EPA to initiate process

