California Air Resources Board

Outboard Marine Tank Public Workshop

Sacramento, CA
January 24, 2007

Agenda

- Introductions
- Background
- Definition of OMT Category
- OMT Test Program
- Preliminary Test Results
- Emissions Estimates
- Control Strategies

Background

- ARB is evaluating a regulation for portable Outboard Marine Tanks (OMTs)
- ARB also working with U.S. EPA to evaluate their proposal including the implementation schedule and level of stringency
- Since April 2006:
  - ARB posted a new OMT web site
  - Discussed test strategies with U.S. EPA
  - Began quantifying emissions while investigating potential control technologies

Background (cont.)

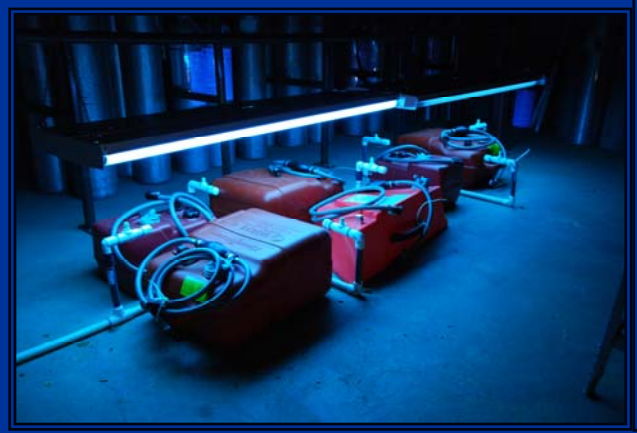
- OMTs and components are constructed of plastic and rubber materials that permeate hydrocarbons
- Openings in a tank's vapor space allows hydrocarbon vapors to vent to ambient air
- Poorly constructed or faulty components permit liquid to leak which evaporates to ambient air
- Cost-effective control technologies are available

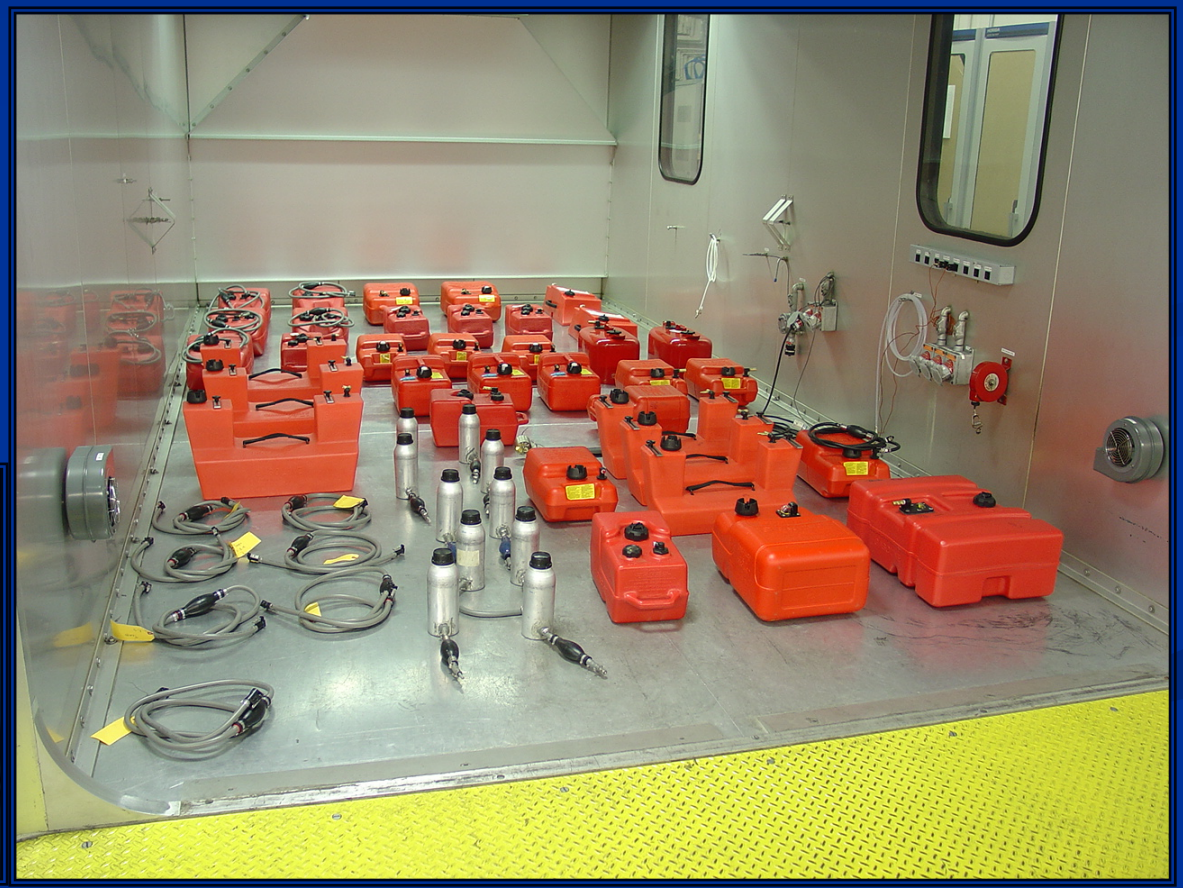
Definition of OMT Category

Fuel Tank and Components

OMT Test Program

- Purpose: To estimate statewide emissions and design simple test procedures for certification and enforcement testing





OMT Test Program (cont.)

- ARB surveyed 24 marine dealers, 5 boat shows, and numerous launch facilities in northern and southern California
- Developed a test matrix of the most common fuel tanks, hoses and components sold
- Analyzed various test methods including the engine/fuel tank relationship

OMT Test Program (cont.)

- 35 tanks, 7 hose assemblies, and 9 Primer Bulbs tested using diurnal temperature profiles

- Fuels tested include:
  - E-10
  - RFG II (MTBE)
  - RFG III (7.47% Ethanol)
  - RFG III Winter Fuel (RVP >11)

- Also tested Primer Bulbs, Fuel Hoses, and Fittings using SAE J1527 (73°F steady-state temp.)

Preliminary Test Results

- Liquid leaks at the tank's fuel fitting make up largest emissions source
  - 18% of all tanks tested
  - 74 – 160 grams/day
- Tank permeation and open Vent Caps make up second largest sources
  - 78% of all tanks tested
  - 2 – 24 grams/day
- Primer Bulbs and Hose Assemblies make up third largest sources
  - Hoses Assemblies 7 – 16 grams/day
  - Primer Bulbs 1 – 9 grams/day

Emission Estimates

- Statewide, uncontrolled emissions are currently estimated at 4 to 8 tons per day
- Figures estimated using available information
- Current estimates may change
  - Statewide phone survey in progress:
    - Number of tanks in California still unclear
    - Process rates and usage information will influence results
    - Test data must still be merged with usage data
    - Manufacturer sales information would prove valuable

Control Strategies

- Based on similar ARB programs such as gas cans, as much as a 75% reduction is possible
- Implement performance standards vs. prescriptive standards
- Model OMT program after similar ARB and U.S. EPA programs with emphasis on enforcement testing
- Control Options:
  - Single diurnal standard and test procedure
  - Individual component standards and test procedures
- Tanks and Vents:
  - Use of barrier technologies to control permeation:

Control Strategies (cont.)

- Improve Tank Fittings to eliminate liquid leakage
- Use of automatic vents to control tank pressure and reduce evaporation (10 vents under test)

Control Strategies (cont.)

- Hoses and Primer Bulbs
  - Investigate Low-Permeation Primer Bulbs
  - Utilize existing fuel hose technology

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