



Cruise Ship Onboard Incineration  
Public Workshop  
Port of Long Beach  
August 24, 2005

Air Resources Board  
California Environmental Protection Agency



## Background

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- Cruise Ship Environmental Task Force Report to the Legislature (August 2003)
- Concern that cruise ships and other marine vessels are a significant source of air pollutants, including toxic and criteria air pollutants
- Increase in number of cruise ships that will operate in California

## Background (cont'd)

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- Cruise ships visit the following locations:
  - About 98 percent of all 2004 port visits to:  
Long Beach, San Diego, San Francisco, Avalon/Catalina
  - About two percent of all 2004 port visits to:  
Hueneme, Humboldt, Monterey, Oakland, Santa Barbara
- Cruise ships accounted for approximately 650 port calls (2004)
  - Approximately seven percent of total port calls



## AB 471

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- Effective January 1, 2005, cruise ships prohibited from conducting onboard incineration within three miles of the California coast
- Reduces exposure to toxic air contaminants, such as dioxins and toxic metals, for residents living near ports and the California coastline
- Air Resources Board (ARB) is developing Airborne Toxic Control Measure (ATCM) to implement this legislation

## **AB 471 - Applicability**

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- Applies to cruise ships that carry 250 or more passengers
- Does not apply to:
  - Vessels without berths or overnight accommodations for passengers
  - Noncommercial vessels, warships, vessels operated by non-profit groups, California or federal government operated ships

## **Existing Requirements for Onboard Incineration**

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- Annex V of MARPOL 73/78
  - Entries in garbage record book
    - Date and time of start and stop of incineration
    - Position of ship (latitude and longitude)
    - Estimated amount of incinerated garbage
    - Signature of officer in charge of operation
- Annex VI of MARPOL 73/78
  - IMO certificate, operating limits for incinerators, prohibition of incineration of certain wastes
  - Entered into force May 19, 2005

## Onboard Incinerator Survey

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- Onboard incinerator survey sent out
- April 2005
  - Determine current incineration practices
  - Amount of garbage
  - Days and hours of operation
  - Air pollution control
  - Alternative waste treatment
  - Responses from 26 ships that travel in California
    - All major cruise lines
    - Responses from the vessels which accounted for 90 percent of 2004 port visits

## Onboard Incinerator Survey Results

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<b>Total Waste Burned per Year for All Locations</b>	<b>Min.</b>	<b>Max.</b>	<b>Avg.</b>
Cubic Meters (22 Ships reporting)	595	8400	4323
Tons (4 ships reporting)	168	3190	1736

## Onboard Incinerator Survey Results

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<b>Total Waste Burned per Year Within Three Miles of the California Coast<sup>1</sup></b>	<b>Cubic meters</b>
Ship One	2600
Ship Two	188

1. For the year 2004 – Prior to the effective date of AB 471.

## Onboard Incinerator Survey Results

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<b>Type of Waste</b>	<b>% ships incinerating waste</b>
Paper products	88
Rags	81
Glass, metal, bottles, crockery, etc.	69
Plastics <sup>1</sup>	65
Ground down paper products	58
Food waste	50
Ground down rags	50
Floating dunnage, lining, packing material	46
Ground down glass, metal, bottles, crockery	35

1. Approximately 50% of ships indicated the plastics they burn are either light plastics or contain no PVC.

## Onboard Incinerator Survey Results

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Control Device	Number of Ships	% of Ships
Wet Collectors (scrubbers), Spray Towers, Venturi Scrubbers	2	8
Dry Scrubber	2	8
Baghouse	3	12
Carbon Adsorption	2	8
Cyclone	1	4
Other (e.g., flue gas cleaning system, combustion control system. etc.)	6	23
No device	10	38

## Onboard Incinerator Survey Results

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- Alternative Treatment
  - Variability among cruise ships
  - Some ships very sophisticated in waste handling practices
    - Recycling Programs
    - Some waste landed ashore for disposal
    - Incinerator ash landed ashore
    - Special waste, including hazardous waste, landed ashore, documentation

## Health Risk Assessment

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- Health and Safety code section 39665 requirements us to evaluate:
  - The potential emissions and health impacts associated with toxic air contaminants
    - Potential cancer risk
    - Noncancer health impacts
  - Data from survey and available source tests will be used to determine emissions and potential health impacts

## Health Risk Assessment (cont'd)

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- Toxic air contaminants typically associated with incineration (land based)
  - Dioxin/furans
    - Highly toxic, persistent and bioaccumulative
  - PAHs
  - Metals
    - Cadmium, lead, mercury, arsenic, nickel, manganese
  - HCl (hydrochloric acid)
  - Other pollutants
    - Particulate matter, hydrocarbons

## Health Risk Assessment (cont'd)

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- Preliminary Results
- Using emission rates from land based municipal waste incineration
- Using stack conditions from cruise ship incinerators
- Potential cancer risk less than one chance per million at three miles away
- Chronic non-cancer health hazard index less than one
- Still evaluating acute health impacts
- Conducting additional health risk analysis

## Three Mile Determination

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- Using the Three Nautical Mile Line as shown on the National Oceanic and Atmospheric (NOAA) Nautical Charts
- State of California comprised of 7 NOAA charts
  - **Chart 18600**, Trinidad Head to Cape Blanco (January 2002)
  - **Chart 18620**, Point Arena to Trinidad Head (June 2002)
  - **Chart 18640**, San Francisco to Point Arena (July 2000)

## Three Mile Determination (cont'd)

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- **Chart 18680**, Point Sur to San Francisco (March 2001)
- **Chart 18700**, Point Conception to Point Sur (July 2003)
- **Chart 18720**, Point Dume to Purisima Point (January 2005)
- **Chart 18740**, San Diego to Santa Rosa Island (August 2003)

## Recordkeeping

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- For voyages which travel within three miles of the California coast or visit California ports or terminals the following is required:
  - Date and time of start and stop of incineration
  - Position of ship in latitude and longitude
  - Signature of officer in charge of the operation
  - Records kept onboard for two years
  - Available upon request for inspection or upon request by Executive Officer

## Enforcement of ATCM

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- ARB enforcement
- Annual onboard inspections
- Review of garbage record logs

## Schedule and Contact

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- Workgroup meetings will continue
- Proposed Regulation and Staff Report
  - September 30, 2005
- Board Hearing
  - November 17 or 18, 2005

Further information

Michelle Komlenic – (916) 322-3926

[mkomleni@arb.ca.gov](mailto:mkomleni@arb.ca.gov)

[www.arb.ca.gov/toxics/crushp/crushp.htm](http://www.arb.ca.gov/toxics/crushp/crushp.htm)

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