Public Workshop to Discuss Reducing Emissions from Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards

Draft Regulatory Proposal

August 24, 2005
Long Beach, California

California Environmental Protection Agency
Air Resources Board

Overview

♦ Background
♦ Applicability
♦ Updated Regulatory Requirements
♦ Estimated Impacts
♦ Next Steps
Background

Goals

♦ Develop statewide control measure to address emissions from mobile cargo handling equipment
  – Achieve maximum emission reductions (both near term and long term) for PM and NOx

♦ Consideration by the Board in November 2005
Applicability

 Ports

- San Diego
- Los Angeles
- Long Beach
- Port Hueneme
- Richmond
- San Francisco
- Oakland
- Sacramento
- Pittsburg
- Crockett
- Antioch, Benicia, Port Chicago (Concord)
- Redwood City
- Port of Humboldt Bay

- Port Hueneme
- Los Angeles
- Long Beach
- San Diego
Examples of Cargo Handling Equipment Types

- yard trucks
- top handlers
- side handlers
- reach stackers
- rubber-tired gantry cranes
- forklifts
- euclids
- skid steer loaders
- rubber-tired loaders
- sweepers
- dozers
- excavators
- mobile cranes
- railcar movers
Overview: Modifications to the Preliminary Concepts

- Refined definitions
- Refined newly purchased/leased/rented equipment requirements
- Refined in-use yard truck requirements and compliance schedule
- Categorized in-use non-yard truck equipment and their requirements
- Added compliance extensions
- Refined/revised record keeping and reporting requirements
- Added Right of Entry and Severability clauses
Newly Purchased, Leased, or Rented Equipment

- DMV registered (onroad) equipment
  - meet current year onroad standard
- Non-registered (off-road) equipment
  a. meet current year onroad standard or Tier 4 off-road standard for model year and rated hp; or
  b. if (a) above is not available, meet highest level available off-road standard for model year and rated hp and apply highest level available VDECS within one year.

In-Use Yard Trucks

Summary of Changes to Proposed Concepts

- Allowed VDECS that would meet the same standards as Tier 4 off-road as a compliance option
- Aligned the compliance for all pre-2003 model years
- Aligned the compliance for all levels of VDECS
- Revised the compliance schedule for fleets of 4 or more
**In-Use Yard Trucks**

**Performance Standards**

- 2007 or current model year onroad engine standard
- Tier 4 off-road engine standard
- Engine with VDECS that meets or exceeds Tier 4 off-road standards

**In-Use Yard Trucks**

**Compliance Table: Fleets of 3 or Less**

<table>
<thead>
<tr>
<th>Engine Certification</th>
<th>Model Years</th>
<th>VDECS as of December 31, 2006</th>
<th>Compliance Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-road</td>
<td>Pre-2003</td>
<td>None</td>
<td>December 31, 2007</td>
</tr>
<tr>
<td>Off-road</td>
<td>Pre-2003</td>
<td>Any Level</td>
<td>December 31, 2008</td>
</tr>
<tr>
<td>Off-road</td>
<td>2003-2006</td>
<td>None</td>
<td>Model Year = 7 Years</td>
</tr>
<tr>
<td>Off-road</td>
<td>2003-2006</td>
<td>Any Level</td>
<td>Model Year = 8 Years</td>
</tr>
<tr>
<td>Onroad</td>
<td>Pre-2007</td>
<td>None</td>
<td>Model Year = 8 Years</td>
</tr>
<tr>
<td>Onroad</td>
<td>Pre-2007</td>
<td>Any Level</td>
<td>Model Year = 9 Years</td>
</tr>
</tbody>
</table>
**In-Use Yard Trucks**

**Compliance Table: Fleets of 4 or More**

<table>
<thead>
<tr>
<th>Engine Certification</th>
<th>Model Years</th>
<th>VDECS</th>
<th>Number of Yard Trucks for Each Model Year Group</th>
<th>Compliance Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-road</td>
<td>Pre-2003</td>
<td>None</td>
<td>The greater of 3 or 50%</td>
<td>December 31, 2007</td>
</tr>
<tr>
<td>Off-road</td>
<td>Pre-2003</td>
<td>Any Level</td>
<td>The greater of 3 or 50%</td>
<td>December 31, 2008</td>
</tr>
<tr>
<td>Off-road</td>
<td>2003-2006</td>
<td>None</td>
<td>The greater of 3 or 25%</td>
<td>December 31, 2009</td>
</tr>
<tr>
<td>Off-road</td>
<td>2003-2006</td>
<td>Any Level</td>
<td>The greater of 3 or 25%</td>
<td>December 31, 2009</td>
</tr>
<tr>
<td>Onroad</td>
<td>Pre-2007</td>
<td>None</td>
<td>The greater of 3 or 25%</td>
<td>December 31, 2009</td>
</tr>
<tr>
<td>Onroad</td>
<td>Pre-2007</td>
<td>Any Level</td>
<td>The greater of 3 or 25%</td>
<td>December 31, 2009</td>
</tr>
</tbody>
</table>

If the percentage of yard trucks in a fleet is not a whole number, conventional rounding practices apply (i.e., if less than 0.5, round down; if 0.5 or greater, round up).

**In-Use Non-Yard Truck Equipment**

**Summary of Changes to Proposed Concepts**

- **Categorized the equipment types**
  1. Basic Container Handling
  2. Bulk Cargo Handling
  3. RTG Cranes
- **Requirement for 2nd step depends on category and level of VDECS**
BACT Requirements for Basic Container Handling Equipment

Option A:
2007 onroad or Tier 4 off-road engine

Option B:
2004 onroad or Tier 2 or 3 off-road engine + highest level VDECS

Option C:
pre-Tier 1 MY or Tier 1 off-road engine + highest level VDECS

Option D:
alternative fuel or diesel pilot ignition engine

In-Use Non-Yard Truck Equipment
Compliance Options – Basic Container Handling Equipment

Option A:
2007 onroad or Tier 4 off-road engine

Option B:
2004 onroad or Tier 2 or 3 off-road engine + highest level VDECS

Option C:
pre-Tier 1 MY or Tier 1 off-road engine + highest level VDECS

Option D:
alternative fuel or diesel pilot ignition engine

Level 1?
Done

No
Replace to Tier 4 or install Level 3 VDECS by Dec. 31, 2015

Level 1 or 2?
Done

No
Replace to Tier 4 or install Level 3 VDECS by Dec. 31, 2015

Done

Done

Done

Done
BACT Requirements for Bulk Cargo Handling Equipment

Option A
2007 onroad or Tier 4 off-road engine
Level 1?
Yes
Replace to Tier 4 or install Level 3 VDECS by Dec. 31, 2015
Done
No

Option B
2004 onroad or Tier 2 or 3 off-road engine + highest level VDECS
Level 1?
Yes
Replace to Tier 4 or install Level 3 VDECS by Dec. 31, 2015
Done
No

Option C
pre-Tier 1 MY or Tier 1 off-road engine + highest level VDECS
Level 1?
Yes
Replace to Tier 4 or install Level 3 VDECS by Dec. 31, 2015
Done
No

Option D
alternative fuel or diesel pilot ignition engine
Done

In-Use Non-Yard Truck Equipment
Compliance Options – Bulk Cargo Handling Equipment
BACT Requirements for RTG Cranes

In-Use Non-Yard Truck Equipment
Compliance Options – RTG Cranes

Option A
2007 onroad or Tier 4 off-road engine

Option B
2004 onroad or Tier 2 or 3 off-road engine + highest level VDECS

Option C
pre-Tier 1 MY or Tier 1 off-road engine + highest level VDECS

Option D
alternative fuel or diesel pilot ignition engine

Option

Replace to Tier 4 or install Level 3 VDECS by later of MY + 12 years or Dec. 31, 2015

Done
Done
Done
Done
# In-Use Non-Yard Truck Equipment

## Compliance Schedule

<table>
<thead>
<tr>
<th>Engine Model Years</th>
<th>Non-Yard Truck Fleets of 3 or Fewer</th>
<th>Non-Yard Truck Fleets of 4 or More**</th>
<th>Compliance Date*</th>
</tr>
</thead>
</table>

* Compliance date refers to December 31** of the year indicated.

** If the percentage of non-yard truck equipment in a fleet is not a whole number, conventional rounding practices apply (i.e., if less than 0.5, round down; if 0.5 or greater, round up).

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## Identification & Demonstration of Emission Control Systems for RTG Cranes, Side Picks, and Top Picks

**Goal:** Identify and demonstrate high efficiency retrofit emission controls and collect data that will lead to verification

**Task 1:** Datalogging
**Task 2:** Solicitation of technology providers
**Task 3:** Solicitation of terminal operators/equipment
**Task 4:** Demonstration study and emissions testing

**Timeline:** June 2005 – March 2006
Compliance Extensions

♦ Engine near retirement
  – if retiring within one year of compliance date
♦ No VDECS available
  – annual extension (limited to two one-year extensions)
♦ Use of experimental Diesel PM Controls
  – up to 2 year extension
♦ Equipment manufacturer delays
  – Equipment must be purchased at least 6 months prior to compliance date
♦ Considering extension for minimum use requirement agreements

Special Circumstances

♦ VDECS failure during warranty period
♦ VDECS failure outside of warranty period
Record Keeping Requirements

♦ Records kept at the terminal
  – Information: owner or operator, equipment/engine, compliance extension, VDECS, fuel, statement of compliance

♦ Records kept in equipment
  – Label with compliance information: VDECS, certified onroad/off-road engine, planned compliance date, compliance extension

Reporting Requirements

♦ Compliance Plan
  – submit by January 31, 2007
  – not binding; want to ensure owner/operator is aware of compliance requirements and has developed plan

♦ Demonstration of Compliance
  – submit by earliest applicable compliance date
  – identify control strategy implemented

♦ Annual Reporting
  – submit annually by January 31st beginning in 2007
  – include company and contact information and location of equipment
Right of Entry, Prohibitions, and Severability

- Allows ARB agent or employee to enter premises and inspect
- Prohibits anyone from knowingly selling, renting, or leasing non-compliant equipment
- Separates from the rest of the regulation any portions that may be deemed invalid

Preliminary Estimated Emission Reductions (Diesel PM)

Baseline and Regulation Diesel PM CHE Emissions Tons per year

<table>
<thead>
<tr>
<th>Year</th>
<th>PM Baseline</th>
<th>PM Reg Influence</th>
<th>PM No Voluntary</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>200</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>2007</td>
<td>150</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>2010</td>
<td>100</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Preliminary Estimated Emission Reductions (NOx)

Baseline and Regulation NOx Emissions
Tons per Year

<table>
<thead>
<tr>
<th>Year</th>
<th>TPY</th>
<th>NOx Baseline</th>
<th>Nox Reg Influence</th>
<th>Nox No Voluntary</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Preliminary Cost Assumptions

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>New Equipment Cost</th>
<th>Used Equipment Cost</th>
<th>Control Device</th>
<th>Control Device Average Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crane</td>
<td>$1,200,000</td>
<td></td>
<td>Passive DPF</td>
<td>$17,520</td>
</tr>
<tr>
<td>Excavator</td>
<td>$350,000</td>
<td>$50,000</td>
<td>DOC</td>
<td>$2,269</td>
</tr>
<tr>
<td>Forklift</td>
<td></td>
<td></td>
<td>Active DPF</td>
<td>$6,000</td>
</tr>
<tr>
<td>Basic Container Handling Equip</td>
<td>$400,000</td>
<td>$50,000</td>
<td>DOC</td>
<td>$2,269</td>
</tr>
<tr>
<td>Other</td>
<td>$400,000</td>
<td>$50,000</td>
<td>DOC</td>
<td>$2,269</td>
</tr>
<tr>
<td>Sweeper/Scrubber</td>
<td>$50,000</td>
<td>$5,000</td>
<td>DOC</td>
<td>$2,269</td>
</tr>
<tr>
<td>Tractor/Loader/Backhoe</td>
<td>$75,000</td>
<td>$10,000</td>
<td>DOC</td>
<td>$2,269</td>
</tr>
<tr>
<td>Yard Tractor</td>
<td>$60,000</td>
<td>$6,000</td>
<td>On-road Engine Option</td>
<td>$1,500</td>
</tr>
</tbody>
</table>

Notes:
Assumed linear depreciation to determine the remaining value of the equipment that was retired early.
Reporting Costs: $10,000 for the first year and $500 per year thereafter.
Preliminary Cost Estimates

<table>
<thead>
<tr>
<th>Total Annual Statewide Costs for Ports and Rail Including the Reporting Costs in 2004 Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>Total Annual Cost (2004 $)</td>
</tr>
<tr>
<td>PM Cost Effectiveness</td>
</tr>
</tbody>
</table>

Next Steps

- Revise draft proposal
- Additional workgroup meetings/workshops as necessary
- Staff report release on September 30th
- Board hearing in November 2005
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