ARB’s Diesel Emissions Programs

Green Fleets:
Kicking Tires and Crunching Numbers
April 7, 2008

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Retrofit Implementation Section
Mobile Source Control Division
• Background
• Diesel Emission Controls Strategies
• Existing Regulations
• Public Agency and Utility Fleet Rule
Where California Needs Regional Reductions

8-hr Ozone Annual

PM 2.5 Annual
Diesel PM Identified as a Toxic Air Contaminant
Today's Health Risks Attributed to Diesel PM

- 3,700 Premature Deaths
- 8,500 Chronic Bronchitis Cases
- 100,000 Asthma Attacks and Respiratory Symptoms
- 2,200 Hospital Admissions
- 620,000 Lost Work Days
- 3.6 Million Minor Restricted Activity Days
Emission Reduction Goals

- **PM strategies intended to:**
  - Reduce exposure risk
  - Reduce mortality
  - Address environmental justice concerns

- **NOx strategies intended to:**
  - Attain ambient air quality standards
  - Reduce mortality
Diesel Risk Reduction Plan

• **Adopted 2000**
  – 75 Percent Risk Reduction by 2010
  – 85 Percent Risk Reduction by 2020

• **Multiple Strategies**
  – Stringent New Engine Standards
  – Cleaner Diesel Fuel (< 15 ppm sulfur)
  – Ensure In-Use Emissions Performance
  – Aggressive Reductions from In-Use Engines
Why Reduce In-use Diesel Emissions?

- Diesel Engines are Long Lived
- New Engine Standards Offer Long Term Reductions
- In-use Emission Rules Provide Near-Term Reductions
- Control Technology is Available
Regulatory Framework for Reducing In-Use Diesel Emissions

- Repower
- Retire
- Use Alternative Fuels
- Retrofit
  - Verified Diesel Emission Control Strategy
• **Advisory on Biodiesel Use**
  - Up to 20% Biodiesel (B20) with CARB diesel
  - Biodiesel must meet ASTM D975

• **Biodiesel Advisory Committee**
  - Developing standards and conducting research
  - Next meeting April 10th, 9am-2pm, 1001 I Street, Sacramento
  - [http://www.arb.ca.gov/fuels/diesel/altdiesel/altdiesel.htm](http://www.arb.ca.gov/fuels/diesel/altdiesel/altdiesel.htm)

• **ARB Fleet and Fuel Regulations**
  - Not an alternative fuel, an alternative diesel fuel
  - Check DECS verification for B20 use
  - Check with your engine manufacturer
Existing Regulations
ARB In-Use Diesel Engine Regulations

- Urban buses 2000
- School bus idling 2000
- Solid waste collection vehicles 2003
- Transport refrigeration units 2004
- Stationary compression ignition engines 2004
- Truck idling 2004
- Portable engines 2004
- Locomotive and harbor craft fuel 2004
- Transit fleet vehicles 2005
ARB In-Use Diesel Engine Regulations

- Public agencies and utility on-road fleets 2005
- Port/rail cargo handling equipment 2005
- Ship auxiliary engine fuel 2005
- Off-road vehicles 2007
- Drayage trucks 2007
- Commercial harborcraft 2008
- Statewide trucks and buses Planned 10/2008
- Agricultural off-road engines Possible 2009
Heavy Duty Vehicle Inspection Program: Looking for Excessive Smoke and Tampering

- Updated regulations adopted by ARB in December 1997
- Opacity cutpoints retained
  - 1991+ engines: 40%
  - pre-1991 engines: 55%
- Use of SAE J1667 test protocol
- Looking for tampered engines & emission control equipment (gasoline & diesel engines)
- Administrative appeals through Administrative Law Judge (ALJ) hearing process
School Bus Idling at Schools

- Applicable to:
  - Buses and Heavy-duty Vehicles
  - All Fuel Types
  - At or Within 100 Feet of K-12 School
    - includes school bus stops and school activity destinations
- Immediately turn off engine and restart 30 seconds before departing
- More Information:
  http://www.arb.ca.gov/regact/sbidling/fro.pdf
Commercial Motor Vehicle Idling

• All commercial on-road diesel-fueled vehicles operating in California with GVWR > 10,000 pounds
• Applies to CA based and non-CA based vehicles operating in CA
• Limits idling to 5 minutes (exceptions)
ARB, in consultation with the CHP, adopted regulations January 1, 2006

Regulations prohibit HDDVs with non-USEPA certified engines from operating in California

All HDDEs must have a factory engine certification label - NTC issued – no violation if fixed within 45 days, $500 if not

ARB and CHP to enforce regulations starting in 2007
Fleet Rule For Public Agencies and Utilities
Scope and Applicability

- Vehicles owned, leased, or operated by a municipality or utility
- Diesel vehicles over 14,000 GVWR
- Medium heavy-duty and heavy heavy-duty engines
- 1960 to 2006 model-year engines
  - Modifications coming in October 2008
    - 2007 and newer not certified to the 0.01g/bhp-hr PM Std.
    - Opt in for all heavy-duty diesel engines
Vehicles Exempt From PAU Fleet Rule

- Emergency vehicles (California Vehicle Code, section 27156.2)
- Military tactical support vehicles (Title 13, California Code of Regulations, section 1905)
- Off-road vehicles (Title 13, California Code of Regulations, sections 2401, 2421, 2411, and 2432)
- School Buses (Vehicle Code 545)
- Vehicles subject to the Fleet Rule for Solid Waste Collection Vehicles and Transit Agencies
Off-Road
Major Elements of the Fleet Rule for Public Agencies and Utilities

- Apply BACT to each engine in engine model year group
- Follow specific implementation schedule based on engine model-year
- Keep records for and label each vehicle
- Remain in compliance
Best Available Control Technology (BACT)

- Alternative Fuels
- Repower (Engine certified to 0.01 g/bhp-hr PM standard, gasoline, or alternative-fuel)
- Retrofit (highest level verified DECS)
- Retire
Level 1 (25 - 50% Reduction)
Diesel Oxidation Catalyst, some with crankcase filter.

Level 2 (50 - 85% Reduction)
Flow-Through-Filter, Emulsified Diesel Fuel, DOC + Emulsified Diesel Fuels

Level 3 (> 85% Reduction or ≤ 0.01 g/bhp-hr)
Active and Passive Diesel Particulate Filters
Currently Verified Technologies: Level 3

http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm

<table>
<thead>
<tr>
<th>PM Level</th>
<th>Product Name</th>
<th>Technology Type</th>
<th>PM Reduction</th>
<th>NOx Reduction</th>
<th>Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cleaire Flash and Catch CRT</td>
<td>DPF</td>
<td>85%</td>
<td>25%</td>
<td>1994+ on-road (limited - Cummins off-cycle NOx engines); 15 ppm sulfur diesel.</td>
</tr>
<tr>
<td></td>
<td>Cleaire Flash and Catch DPX</td>
<td>DPF</td>
<td>85%</td>
<td>25%</td>
<td>1994+ on-road (limited - Cummins off-cycle NOx engines); 15 ppm sulfur diesel.</td>
</tr>
<tr>
<td></td>
<td>Cleaire Horizon</td>
<td>DPF</td>
<td>85%</td>
<td>N/A</td>
<td>1994-2005 on-road; 15 ppm sulfur diesel; CARB diesel</td>
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<tr>
<td></td>
<td>Cleaire Longview Catalyst and DPX</td>
<td>Lean NOx Catalyst and DPF</td>
<td>85%</td>
<td>25%</td>
<td>1993-2003 model year on-road; 15 ppm sulfur diesel.</td>
</tr>
<tr>
<td></td>
<td>CleanAIR Systems PERMIT</td>
<td>DPF</td>
<td>85%</td>
<td>N/A</td>
<td>Stationary emergency generators; 15 ppm sulfur diesel.</td>
</tr>
<tr>
<td></td>
<td>Donaldson DPM</td>
<td>DPF</td>
<td>85%</td>
<td>N/A</td>
<td>1993-2004 on-road; 15 ppm sulfur diesel.</td>
</tr>
<tr>
<td></td>
<td>International Truck and Engine Corps DPX</td>
<td>DPF</td>
<td>85%</td>
<td>N/A</td>
<td>1994-2003 on-road Navistar (International); 15 ppm sulfur diesel.</td>
</tr>
</tbody>
</table>
• **Retire**
  - Sold outside of California
  - Meets BACT requirement if transferred to a fleet within California
  - Engine dismantled for scrap
  - Converted for use as a low usage or low-population low usage vehicle
  - Keep records to document retirement
    • Vin Stop Application available
## Implementation Schedule for All Fleets

<table>
<thead>
<tr>
<th>Group</th>
<th>Engine Model-Years</th>
<th>Percentage of Group to use BACT</th>
<th>Compliance Deadline as of December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1960 - 1987</td>
<td>20% 60% 100%</td>
<td>2007 2009 2011</td>
</tr>
<tr>
<td>2</td>
<td>1988 - 2002</td>
<td>20% 60% 100%</td>
<td>2007 2009 2011</td>
</tr>
<tr>
<td>3</td>
<td>2003 – 2006</td>
<td>50% 100%</td>
<td>2009 2010</td>
</tr>
</tbody>
</table>

<sup>a</sup> An owner may not use a Level 1 technology as BACT on Group 1 engines.
- Early Implementation
- No verified DECS available
- Dual-fuel or bi-fuel engine
- Engine one year from retirement
- Experimental DECS
- Low Population Counties
- **Facility Records**
  - Individual records by vehicle
  - Kept centrally
  - Available for inspection by appointment

- **Vehicle labeling**
  - Door jamb
  - Location **known** by driver
  - Durable and legible
• Statement certifying that engines are in compliance as required
• Start December 31 of 2007, renew each December 31 until December 31, 2012
• Low-population counties continue reporting until 2018
Contracts with an effective date of December 31, 2007 or later must include language:

– Contractor must comply with all federal, state, and local air pollution control laws and regulations applicable to the contractor.
Non-Compliance

- Violations may carry civil penalties as specified by state law
- Failure to keep required vehicle records
  - may be subject to a $100 fine for each day records are not kept
- Failure to label vehicles
  - may be subject to a $100 fine per vehicle for each day labels are not kept
Other Contacts

Diesel Activities:
www.arb.ca.gov/diesel/diesel.htm

Public Agency and Utility Fleet Rule
www.arb.ca.gov/msprog/publicfleets/publicfleets.htm

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