Public Hearing to Consider Proposed Amendments to Transport Refrigeration Unit (TRU) Airborne Toxic Control Measure (ATCM)

Sacramento, California
October 21, 2011
Overview

• Background
• Emissions Inventory Update
• Proposed Amendments
• Economic Impacts
• Emissions Impacts
• Health Impacts
• Recommendation
Background

• Diesel PM identified as TAC in 1998
• TRU’s congregate in large numbers at distribution centers
  – Very high near-source risk (> 100/million common)
• TRU ATCM adopted 2004
• U.S. EPA approved waiver
  January 16, 2009
• 2010 Amendments
  – Board direction
TRU Applications

• What is a TRU?
  – Refrigeration systems powered by integral diesel engines
  – Used to control the environment of temperature sensitive products that are transported in trucks, semi-trailers, railcars, and shipping containers
Primary Requirements of Current Regulation

• Web-based registration
  – Voluntary for TRUs based outside California

• Submit Operator Reports
  – California terminals where TRUs are assigned

• Meet in-use performance standards
  – Affects all TRUs that operate in California
  – Phased compliance schedule based on 7-year operational life
In-Use Performance Standards

- Two levels of stringency
  - Low-Emission TRU (LETRU)
    - >50 percent PM emission reduction
  - Ultra-Low-Emission TRU (ULETRU)
    - >85 percent PM emission reduction

- Compliance options available now
  - Repower - engine replacement
  - Retrofit with verified diesel particulate filter
  - Use alternative technology - hybrid electric
  - Available now for model year 2004
In-Use Performance Standard Compliance Schedule

- Engine model year (MY) 2003 and older
  - Step 1: Meet LETRU when 7 years old
  - Step 2: Meet ULETRU when 14 years old

- Engine MY 2004 and newer
  - Skip LETRU
  - Meet ULETRU when 7 years old
Implementation Status

- Outreach training, compliance assistance
- Stakeholder issue meetings
- Regulatory advisories
- Compliance technology development and verification
- Technology forums
- Web-based TRU registration system
- Toll-free helpline
Implementation Status (Cont.)

- Enforcement
  - Registration and in-use requirements
  - Inspections at:
    - Border crossings
    - Scales
    - Ports
    - Intermodal facilities
    - Distribution centers
    - Ag inspection stations
    - Carrier terminals
Implementation Status
(Cont.)

• Compliance Assistance
  – Letters to owners registered in ARBER
  – Emails to TRU List Serve
  – Developing a List of “100% Compliant Fleets”
2010 Amendments

• Board approved three amendments needed by the end of 2010
  – Added compliance options for MY 2003 engines
  – Addressed flexibility engines
  – Enhanced OEM Reporting

• Board directed staff to:
  – Evaluate request for longer operational life
    • Emissions inventory update
    • Cost of compliance – economic impacts update
    • Health risk assessment update
Evaluate Longer Operational Life
MY 2004 and Newer Engines

- Impact of extending operational life to 8, 9, or 10 years
  - Public health risk at existing 7 years is too high
  - Potential public health impacts from delay
    - Increasing operational life to 8-10 years erodes cancer risk reductions by about 10-40 percent
- Staff recommends maintaining existing 7-year operational lifetime requirement
Evaluate Longer Operational Life
Health Risk at TRU Facilities

- Estimated off-site potential cancer risk from a “typical” facility with current 7-year operational life:

<table>
<thead>
<tr>
<th>Activity (Engine Hours Per Week)</th>
<th>Loads Per Week</th>
<th>Near-Source Cancer Health Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>40</td>
<td>&gt;10 per million</td>
</tr>
<tr>
<td>1000</td>
<td>400</td>
<td>&gt;100 per million</td>
</tr>
</tbody>
</table>

- Activity at “large” distribution centers is higher
  - Average is about 2,000 hours per week
  - Highest reported: >8,000 hours per week
Evaluate Longer Operational Life Health Risk at TRU Facilities (Cont.)

- At least 500 facilities with a potential cancer risk above 10/million

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Total Number of Facilities</th>
<th>&gt;100 hrs/week</th>
<th>&gt;1,000 hrs/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Facility Survey</td>
<td>56</td>
<td>51</td>
<td>33</td>
</tr>
<tr>
<td>ARBER Operator Reports</td>
<td>500-650</td>
<td>400-500</td>
<td>Needs further study</td>
</tr>
</tbody>
</table>

- At least 50% of these located near residences, off-site workplaces, and sensitive receptors
TRU Emission Inventory Update

- New input data collected since 2003 and applied to current inventory includes:

<table>
<thead>
<tr>
<th>Input</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-state population</td>
<td>2011 ARBER</td>
</tr>
<tr>
<td>Daily out-of-state population</td>
<td>2010 Truck and Bus Rule</td>
</tr>
<tr>
<td>Engine load factors</td>
<td>Manufacturer input, engine performance data</td>
</tr>
<tr>
<td>Annual engine activity, overall</td>
<td>2006 Facility Survey, 2010 Truck and Bus Rule</td>
</tr>
<tr>
<td>Annual engine activity, in-state</td>
<td>2006 Facility Survey</td>
</tr>
<tr>
<td>Emission Factors</td>
<td>Tier 4 final Standards</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>1990-2010 national engine sales</td>
</tr>
</tbody>
</table>
### TRU Emission Inventory Update (Cont.)

<table>
<thead>
<tr>
<th>Input</th>
<th>2011 Compared to 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-state population</td>
<td>20 percent lower</td>
</tr>
<tr>
<td>Daily out-of-state population</td>
<td>10 percent lower</td>
</tr>
<tr>
<td>Engine load factors</td>
<td>13 percent lower</td>
</tr>
<tr>
<td>Annual engine activity, overall</td>
<td>15 percent higher, per unit</td>
</tr>
<tr>
<td>Annual engine activity, in-state</td>
<td>8 percent lower</td>
</tr>
<tr>
<td>Emission Factors</td>
<td>Future emission factors lower to reflect standard</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>50 percent lower</td>
</tr>
</tbody>
</table>
TRU Emission Inventory Update
Statewide PM Emissions

2011 PM Baseline (no regulation)
TRU Emission Inventory Update
Statewide PM Emissions

![Graph showing PM emissions over time with two lines representing baseline (no regulation) and emissions with rule changes.](image)
Economic Impacts Update
Actual Compared to 2003 Staff Report

• Actual capital costs increased
• Operating and maintenance costs refined
• Compliance methods actually used
  – VDECS retrofits (20%)
  – Engine repowers (70%)
  – Unit replacements (10%)
  – Alternative Technologies (< 1%)
• Cost-Effectiveness changed
  – $83 per pound PM (originally estimated $10 to $20 per pound)
Proposed Amendments

- Extension of ULETRU compliance date for some MY 2003 and older engines
- Provide flexibility
- Improve enforceability
- Improve compliance rates
- Clarify existing requirements
Proposed Amendments
Extension for MY 2003 and Older Engines

- Model year 2003 and older, if met LETRU
  - Extend ULETRU compliance date 1 year
  - MY 2001 and older, if met LETRU by 12-31-08, results in 2 year ULETRU extension
- Extends operational life
- Restores competitive fairness for emission reduction actions taken
- Negligible emissions and risk impacts
Proposed Amendments
Administrative Extensions

• Up to one-year extension if complying technology is not available
  – Application required before deadline
  – Demonstrates no suitable filter or engine available

• Up to four-month extension if delivery or installation are delayed

• Case-by-case consideration
Proposed Amendments
Provide Flexibility

• Use of unit manufacture year instead of engine model year - extends operational life
• Use of unique equipment identification numbers instead of ARB’s
• Exemptions
  – Obviously nonoperational equipment
  – Non-diesel-powered refrigeration systems
  – TRUs used during certain emergencies
Proposed Amendments
Improve Enforceability

• Clarify recordkeeping requirements for hybrid electric TRUs
  – TRU engine operation eliminated at nonretail facilities (distribution centers)
  – Electric power plugs must be available
  – TRU engine operation limited to less than 30 minutes at retail delivery points

• Automated electronic tracking and reporting phased in, starting 2013
  – Small initial capital cost
  – Significant labor savings – expected payback less than 1 year
Proposed Amendments
Improve Compliance Rates

- Hired or contracted carriers must dispatch compliant TRUs
  - Brokers, shippers, and receivers must demonstrate due diligence
  - Contract with carrier must specify use of ARB-compliant equipment
- Minimizes unfair competition created by noncompliant equipment
Proposed Amendments
Improve Compliance Rates (Cont.)

- TRU manufacturers and engine rebuilders
  - Provide registration information documents and supplemental engine labels
- Dealers and repair shops
  - Pass registration information documents to next party in chain (ultimately to the end-user)
- TRU manufacturers that use flexibility engines
  - Notify ARB
  - Provide supplemental labels and written disclosure
Proposed Amendments
Clarifications

• Repowering with a new replacement or a rebuilt engine
  – Effective model year determines when it must meet the in-use standards
• Noncompliant equipment
  – Flexibility for dealers to possess, sell, and move noncompliant units
  – Seller must disclose noncompliant status to buyer
• Requirements for lessors and lessees
• Engine rebuilders
  – Rebuild to a cleaner configuration
## Economic Impacts
### 2011 Amendments

<table>
<thead>
<tr>
<th>Proposed Amendment</th>
<th>Statewide Regulatory Cost or (Savings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULETRU Extension for ≤ MY 2003 Timely LETRU Compliance</td>
<td>($350,000)</td>
</tr>
<tr>
<td>Electronic Recordkeeping for Hybrid Electric/Electric Standby</td>
<td>($3.9 million)</td>
</tr>
<tr>
<td>Compliance Verification for Responsible Parties</td>
<td>$11 million</td>
</tr>
<tr>
<td>Exemption of TRUs Used During Emergencies</td>
<td>($340,000)</td>
</tr>
<tr>
<td>Use of TRU Manufacture Year</td>
<td>($21 million)</td>
</tr>
<tr>
<td>Supplemental Labels and Registration Information</td>
<td>$1.6 million</td>
</tr>
<tr>
<td>Net Total Cost or (Savings)</td>
<td>($13 million)</td>
</tr>
</tbody>
</table>
Emissions Impacts
Proposed Amendments

Graph showing PM emissions (tons per day) from 2011 to 2020, comparing emissions with existing rule and proposed amendments.
Health Impacts
Proposed Amendments

• Small annual reductions deferred several years
  – Combined emissions impacts for all proposed amendments totals 0.21 tpd (2009 to 2018)
• Emission reductions continue
• Public health risk reductions at distribution centers continues
Compliance Options

• Several options for complying with standards
• Engine or unit replacement
  – Chosen for 80% of units, readily available
• Retrofits
  – Chosen for 20% of units
  – Availability of Level 3 retrofit (>25 hp MY 2004)
    • One fully verified Level 3 retrofit available now
    • 2nd expected to be verified and available fall 2011
  – Amendments allow Executive Officer to extend compliance
deadline for availability, delivery, and installation delays
Staff’s Suggested Modifications to Proposed Amendments

- OEMs provide disclosure document with units that are equipped with a flexibility engine.
- Dealers notify the end-user that unit is equipped with a flexibility engine and provide the OEM’s written disclosure.
- Provide OEM the flexibility to develop alternatives to providing registration information documents with each unit.
Recommendation

• Adopt the proposed amendments

• Direct staff to:
  – Continue outreach efforts
  – Continue working with brokers, shippers, and receivers on compliance assistance tools
  – Administratively implement the Executive Officer extension authority for MY 2004, if necessary
  – Continue to work with electronic tracking system suppliers
  – Evaluate alternatives to enable TRUs rated at less than 25 hp to comply with ULETRU