

**Transport Refrigeration Unit (TRU)
Airborne Toxic Control Measure (ATCM)
Amendment Workshop #3**

August 18, 2010
Byron Sher Auditorium, Sacramento, CA



California Environmental Protection Agency
 **Air Resources Board**

TRU Regulation

Outline

- Background Information
- Reduced Scope of Proposed Amendments
- Emissions Impacts of Proposed Amendments
- Compliance Cost Impacts
- Public Health Impacts
- Next Steps
- Email comments:
 - auditorium@calepa.ca.gov



**Background
History**

- TRU ATCM adopted February 2004
- Effective December 2004
- U.S. EPA approved waiver January 16, 2009
- Enforcement delayed until July 16, 2009
- Second enforcement delay to December 31, 2009

Background Why Control TRU Emissions?

- Emissions per unit are high
- Large numbers congregate at distribution centers, cold storage warehouses, ports, and rail yards
- High near-source public health risk
- Often near residences, schools, hospitals
- Contribute to overall exposure to diesel PM
- Large reductions are possible

Background Basic Requirements

- Registration in ARBER – by July 31, 2009
 - All TRUs based in California
 - Voluntary for TRUs based outside California
- Operator Reports – by July 31, 2009
 - Affects all California terminals where TRUs are assigned
- Meet in-use performance standards
 - Affects all TRUs that operate in California
 - Phased compliance schedule – seven years after engine model year

Background Compliance Options

- Retrofit with correct level of VDECS
 - LETRU – Level 2 VDECS (50 percent PM Reduction)
 - ULETRU – Level 3 VDECS (85 percent PM reduction)
- Use Alternative Technology (meets ULETRU only if TRU engine operation is eliminated)
 - Electric standby/Hybrid electric
 - Hybrid cryogenic
- Engine re-power – resets the compliance clock
- Unit replacement – resets the compliance clock

Reduced Scope Proposed Amendments

- **Most time-critical amendments**
 - **In-use Emission Standard Amendment**
 - MY 2003 trailer TRU engines (25 hp and greater)
 - MY 2003 and 2004 truck TRU engines (under 25 hp)
 - **Flexibility Engines - “Effective model year”**
 - **TRU Manufacturers Reporting**
 - **Proposed regulatory language at:**
 - www.arb.ca.gov/diesel/tru/workshops.htm
- **Less time-critical issues - 2011 rulemaking**
 - Tentative Board consideration July 2011

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In-use Emission Standard Amendments §2477(e)(1)(B)

- **Change in-use standard for MY 2003 trailer TRU engines (25 hp and greater)**
 - **Currently requires ULETRU by end of 2010**
 - Retrofit with Level 3 VDECS or replace engine
 - One Level 3 VDECS now available
 - **Changing to LETRU by December 31, 2010**
 - Retrofit with Level 2 VDECS
 - Then comply with ULETRU by December 31, 2017

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Revised In-Use Standards and Schedule §2477(e)(1)(B)

≥25 HP TRU and TRU Generator Set Engines
In-Use Compliance Dates

MY	In-Use Compliance Year													
	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older		L	L	L	L	L	L	L	L	U	U	U	U	U
'02			L	L	L	L	L	L	L	U	U	U	U	U
'03				L	L	L	L	L	L	L	U	U	U	U
'04					U	U	U	U	U	U	U	U	U	U
'05						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

Note: The compliance date is December 31st of the year shown in the column headings.

"L" stands for LETRU, or Low-Emissions TRU in-use performance standard.

"U" stands for ULETRU, or Ultra-Low-Emissions TRU in-use performance standard.

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In-Use Emission Standard Revision §2477(e)(1)(B)

- Change in-use standard for MY 2003 and 2004 truck TRU engines (less than 25 hp)
 - Currently requires ULETRU
 - Retrofit with Level 3 VDECS or replace engine
 - Propose changing to LETRU
 - Retrofit with Level 2 VDECS or replace engine
 - MY 2003 comply with LETRU by December 31, 2010
 - MY 2004 comply with LETRU by December 31, 2011
 - Meet ULETRU 7 years later

Revised In-Use Standards and Schedule §2477(e)(1)(B)

<25 HP TRU and TRU Generator Set Engines
In-Use Compliance Dates

MY	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older	L	L	L	L	L	L	L	L	U	U	U	U	U	U
'02			L	L	L	L	L	L	U	U	U	U	U	U
'03				L	L	L	L	L	L	U	U	U	U	U
'04					L	L	L	L	L	L	U	U	U	U
'05						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

Note: The compliance date is December 31st of the year shown in the column headings.
 "L" stands for LETRU, or Low-Emissions TRU in-use performance standard.
 "U" stands for ULETRU, or Ultra-Low-Emissions TRU in-use performance standard.¹¹

Definition of Model Year §2477(d)

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- “Model Year” definition revised such that engines manufactured to meet a prior tier emissions standard must use the last year the prior tier was in effect as the “effective model year”
- Engines manufactured to meet the current emissions standard tier that is in effect will have the model year on the engine emissions label.

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Definition of Effective Model Year §2477(d)

“Effective Model Year” means the last year that a prior-tier standard was in effect

Prior-Tier Emissions Standard	Tier Standard Effective Years	Effective Model Year
Tier 1, 25-50 hp (trailer)	1999-2003	2003
Tier 1, under 25 hp (truck)	2000-2004	2004
Tier 2, 25-50 hp (trailer)	2004-2007	2007
Tier 2, under 25 hp (truck)	2005-2007	2007
Tier 4i, 25-50 hp (trailer)(pre-tier after 2012)	2008-2012	2012 (after Tier 4f becomes effective)

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Revision to Address “Flexibility” Engines §2477(d)

- Flexibility engine is defined as:**
 - an engine installed in new equipment by an original equipment manufacturer under the State and federal Transitional Program for Equipment Manufacturers
- Flexibility engines meet a prior tier standard, not the current tier standard**
- The effective model year shall be used for flexibility engines to determine in-use performance standards and compliance dates**
 - Exception made for engines installed before December 31, 2010

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Revision to Address “Flexibility” Engines §2477(e)(1)(B)5.

- TRU units with flexibility engines produced before 12-31-2010:**
 - ULETRU compliance date determined by engine manufacture year
 - OEMs must provide unit and engine information to ARB
 - Unit must be registered in ARBER by December 31, 2010
 - ARB will make a one-time adjustment to units registered in ARBER

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Revision to Address "Flexibility" Engines §2477(e)(1)(B)5.

•TRU units produced after 12-31-2010:

- Compliance based on the engine's effective model year if flex engines are used
- ULETRU must be met by the 7th year after the effective model year

Example: For Tier 4i engine used in 2013 or later (when Tier 4f is in effect), the effective model year is 2012 and must meet ULETRU by the end of 2019

TRU Manufacturer Reporting §2477(f)(3)(A) and (B)

• Require TRU manufacturers to periodically report unit and engine data to ARB:

- Unit and engine model information for next production year
- Production information for prior years:
 - Number of units produced by horsepower category for California, U.S., Canada, and Mexico
 - Unit and engine information for prior production years

Emissions Impacts of Proposed Amendments

Emission Inventory Adjustments

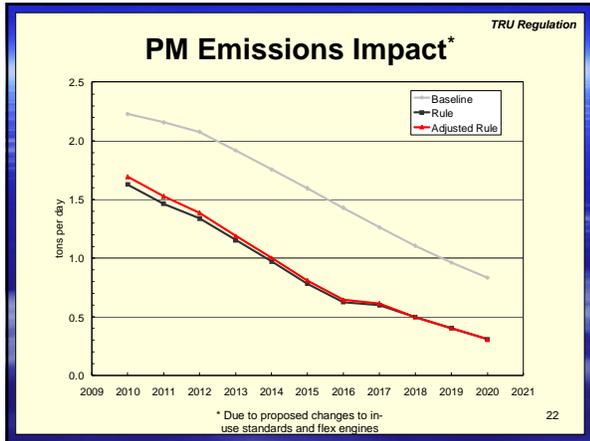
1. In-use Emission Standard Amendment
2. Accounting for Flexibility Engines

In-use Emission Standard Amendment

- Proposing change from ULETRU to LETRU for segment of TRU population
 - All MY 2003 TRU and genset engines
 - MY 2004 TRU engines less than 25 hp
 - 50% reduction in place of 85% reduction
 - Affects about 4,000 engines
- Ultra-low emission standard required after seven years

Accounting for flexibility engines

- For Truck/Trailer TRUs sold between 2004 and 2006 with engines meeting 2003 standards
 - Industry sales data used to estimate share
 - Emission factors adjusted to account for share
 - All other factors identical to other TRUs sold in same calendar year
- Affected TRUs to be equipped with ultra-low emission reduction technology between 2011 and 2013



- TRU Regulation
- ### Results of Inventory Adjustment
- **In-use Emission Standard Amendment**
 - Small impact on PM until 2018; zero impact thereafter
 - Zero impact on NOx
 - **Accounting for Flexibility Engines**
 - Small increases for both PM and NOx in estimated baseline emissions and regulatory benefits
 - PM impact decreases in 2012-14 with implementation of control technology
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Amendment Compliance Cost Impacts (Preliminary)

- **Change In-Use Standard for MY 2003 in 2010:**
 - VDECS Level 3 to Level 2
 - compliance cost decreases:

Horsepower	Cost of Level 2 VDECS ¹	Cost of Level 3 VDECS ¹	Cost Decrease between Level 3 and Level 2
Less than 25	\$3,650	\$6,000	\$2,350
25-50	\$4,700	\$6,000	\$1,300

¹Includes VDECS, labor, and consumables

- MY 2002 compliance - about 30 percent retrofitted
- Staff expects similar choice trend for MY 2003 engines
- Total savings – about \$5 million
- Amendments do not impact cost to repower

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Amendment Compliance Cost Impacts (Preliminary)

- **Flexibility engines**
 - No change - returning to original assumptions
 - Costs in 2003 Staff Report were originally based on TRU sales
- **TRU manufacturer reporting**
 - Not expected to be significant
 - Estimates will be included in staff report

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Public Health Impacts Of Proposed Amendments (Preliminary)

- Modeled public exposure for 2010 using adjusted emissions factors for 2010
- Estimated change in public exposure due to proposed amendments
- Change in cancer risk less than 1 extra potential cancer case per million people
- Public health risk is essentially unchanged by proposed amendments

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Rulemaking Process Up to Present

- **Workshops - informal comments**
 - March 24, 2010 - Draft concepts were presented
 - July 8, 2010 - Draft regulatory language was presented
 - August 18, 2010 – Reduced scope draft language for critical items

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Next Steps

- **45-Day Public Notice of Rulemaking**
 - Formal comment period begins September 29, 2010
- **Board Public Hearing – November 18, 2010**
 - Sacramento, California
 - Formal comments to Board
 - Formal comment period ends
- **2011 rulemaking for remaining amendments**
 - Board public hearing tentatively scheduled for July 2011

TRU Regulation Contact Information

- TRU website: <http://www.arb.ca.gov/diesel/tru.htm>
- TRU List Serve: <http://www.arb.ca.gov/listserv/tru.htm>
- TRU Help Line: 1-888-878-2826 (1-888-TRU-ATCM)
- Comments after workshop:
Rich Boyd (rboyd@arb.ca.gov, 916-322-8285) or
Rod Hill (rhill@arb.ca.gov, 916-327-5636)



Discussion

Questions and Comments

During workshop:

- Email questions and comments during workshop to: auditorium@calepa.ca.gov
- Conference call-in line
Toll-free in US and Canada: 800-779-1505
Toll Number: 212-287-1669
Passcode: 55390

After workshop:

- Call Rich Boyd (916-322-8285) or Rod Hill (916-327-5636)
