

Enhanced Vapor Recovery Technology Review Workshop

October 9, 2001

Air Resources Board

California Environmental
Protection Agency



Agenda

- Introduction
- Status Report on July 2001 EVR Standards
- Criteria for Technological Feasibility
- Scope of EVR Technology Review
- Lunch

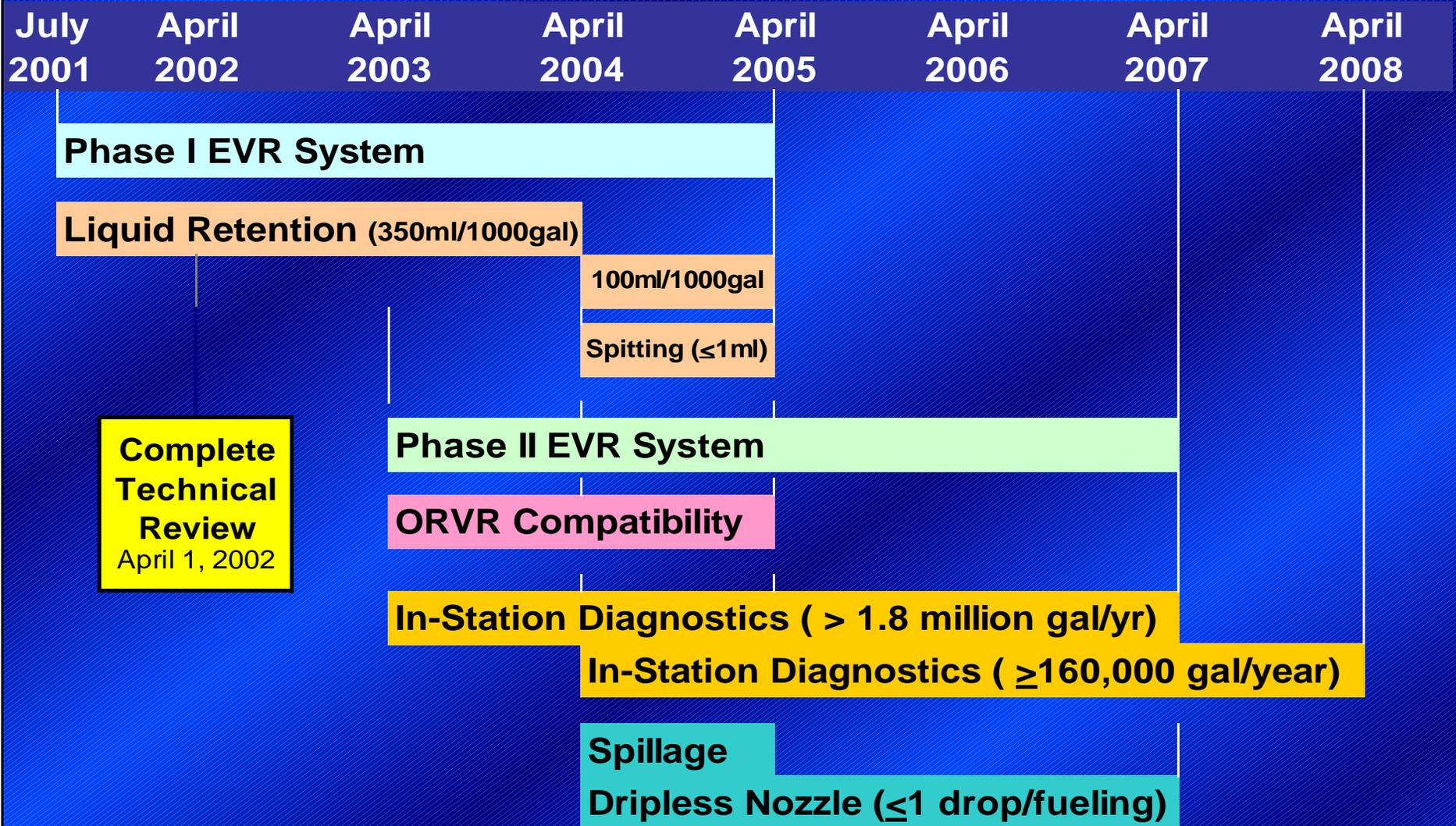
Agenda (cont.)

- Alternatives to EVR Standards
- Cost-Effectiveness Methodology Review
- Technology Review Schedule
- Phase I System Definition

Tech Review Direction from March 2000 Resolution

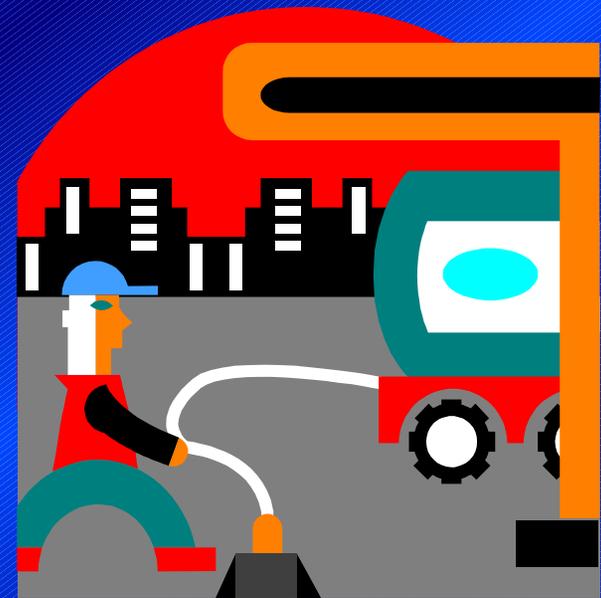
- Standards with future effective or operative dates, including ISD, nozzle performance standards & ORVR compatibility
- Comprehensive, thorough and rigorous
- Evaluate practical alternatives
- Hold workshops
- Complete tech review by April 1, 2002

The Enhanced Vapor Recovery Timeline



Status on July 2001 Standards

- 350 ml/1000 gal liquid retention
 - certified nozzles tested have passed
 - list in EO G-70-199
- EVR Phase I
 - one system certified
 - EO VR-101-A



Scope of Tech Review

- ORVR
Compatibility
- Phase II
Standards
- “Nozzle”
standards
- In-Station
Diagnostics



Criteria for Technological Feasibility

Feasible?	Demonstration
Yes	Certified system OR ARB or manufacturer data shows meets standard
Likely	Information suggests standard can be met
Maybe	Development underway to meet standard
Not yet	Data indicates can't meet standard now

ORVR Compatibility

- Refueling vehicles equipped with onboard refueling vapor recovery shall not cause the system to exceed the Phase II emission factor
- Three Phase II systems have been certified as ORVR compatible
- Technologically feasible

Phase II/ORVR Compatibility Implementation

Date	ORVR Action
Jan 2001	All Phase II systems certified must be ORVR compatible
Apr 2001	Start of "4-year clock"
Apr 2003	New Phase II installations must be ORVR compatible
Apr 2005	All Phase II systems must be ORVR compatible

Standards and Specifications

- All EVR standards and specifications in CP-201 and ISD appendix initially considered
- Specifications set during certification not included

Phase II Standards

Standard/Specification	Feasibility Status
Static Pressure Performance	Yes
Liquid Removal (5 ml/gal)	Yes
Nozzle/Dispenser Compatibility	Yes
Unihose MPD Configuration	Yes

Phase II Standards

Standard/Specification	Feasibility Status
Vapor Piping Requirements (slope, diameter, etc.)	Yes
Liquid Condensate Traps	Yes
Leak-tight Connectors and Fittings	Yes
Dynamic Pressure Drop	Yes
Max. A/L of 1.00 for System Without Processor	Yes

Phase II Standards

Standard/Specification	Feasibility Status
HAPs from Destructive Processors 1.2 lbs/yr 1,3-butadiene	Yes
84 lbs/yr acetaldehyde	Yes
36 lbs/yr formaldehyde	Likely
UST Pressure Criteria Daily avg $\leq +0.25$ in water Daily high $\leq +1.5$ in water Non-excluded hours = 0 ± 0.05 in	Yes

Phase II Standards

Standard/Specification	Feasibility Status
Phase II Emission Factor (incl. pressure-related fugitives)	Likely
Phase II Compatibility with Phase I Systems	Likely
Balance System Component Pressure Drops	Likely

Phase II Standards

Standard/Specification	Feasibility Status
Max. A/L Ratio of 1.30 for System with Processor	Maybe
Max. HC Rate to Processor	Maybe

"Nozzle" Standards

Standard/Specification	Feasibility Status
Balance: vapor check valve	Yes
Balance: insertion interlock	Yes
Balance: Check valve leakrate < 0.07 CFH at 2 in water	Yes

"Nozzle" Standards

Standard/Specification	Feasibility Status
Assist: vapor check valve	Yes
Assist: mini-boot	Yes
Assist: Check valve leakrate ≤ 0.038 CFH at +2 in water	Yes
Assist: Check valve leakrate ≤ 0.07 CFH at -100 in water	Yes

"Nozzle" Standards

Standard/Specification	Feasibility Status
OD \leq 0.84 in for 2.5 in of spout (Ring Test)	Yes
Fuel Any Vehicle that can be Fueled with Conventional Nozzle	Yes
Liquid Retention \leq 100 ml/1000 gal	Yes

"Nozzle" Standards

Standard/Specification	Feasibility Status
Spillage (incl. Spout Drips) ≤ 0.24 lbs/1000 gal	Maybe
Post-Refueling Drips ≤ 1 drop/refueling	Maybe
Nozzle Spitting < 1.0 ml/nozzle/test	Maybe

ISD Detection

Standard/Specification	Feasibility Status
Detect System Failure > 95% of the Time	Maybe
ISD System designates "Failure" to a Correctly Operating System < 1% of the Time	Maybe

ISD Response to System Failure

Standard/Specification	Feasibility Status
Activate Alarm	Likely
Record Event	Likely
Prohibit Fueling	Yes
Re-Enable Dispensing	Maybe
Record Re-Enable Event	Maybe

ISD Pressure

Standard/Specification	Feasibility Status
Exclude Pressure During Phase I Deliveries	Likely
Gross Failure Test (P > 1.5")	Likely
Degradation Test (P > 0.5")	Likely
Pressure Integrity Test (Twice TP-201.3 Leak Rate)	Likely

ISD Vacuum-Assist A/L

Standard/Specification	Feasibility Status
Measure Gross Failure (A/L < 25% or A/L > 175%)	Likely
Measure Degradation (A/L < 75% or A/L > 125%)	Likely

ISD Balance System

Standard/Specification	Feasibility Status
Measure Flow Performance	Likely
Identify < 50% Normal Flow Performance	Likely

ISD Central Vacuum System

Standard/Specification	Feasibility Status
Record Pressure Once/Minute	Likely
Pressure Verification (Per EO)	Likely

ISD Data and Reports

Standard/Specification	Feasibility Status
Daily Report	Yes
Monthly Report	Yes
Archive Records	Likely
Records Preserved if Loss of Power to ISD System	Likely

ISD Tampering

Standard/Specification	Feasibility Status
Resist Unauthorized Tampering	Maybe
Show if Unauthorized Tampering has Occurred	Maybe

ISD Functioning

Standard/Specification	Feasibility Status
Self Diagnostic Check	Likely
ISD System Operational > 95% of the Time on an Annual Basis	Likely
Record Up-Time on a Daily Basis	Likely

ISD Standardization

Standard/Specification	Feasibility Status
RS232 Port	Yes
Standardized Software	Likely
Remote Access	Yes

Alternatives to EVR Standards

- The technology review shall include an evaluation of all practical alternatives to, and means of meeting, the requirements of Enhanced Vapor Recovery goals
- Need input from stakeholders

Cost Methodology

- Based on EVR approach
- Described in Feb. 4, 2000 EVR Staff Report (ISOR)
- Available on webpage:
<http://www.arb.ca.gov/regact/march2000evr/march2000evr.htm>

Conservative Assumptions

- All vapor recovery equipment components would be replaced
- "Retail list" prices
- EVR nozzles will cost 75% more

GDF Classification

Group	1	2	3	4	5
gal/mo	13,233	37,500	75,000	150,000	300,000
%	4.7	14.1	45.7	31.3	4.2

Gasoline Dispensing Facility (GDF) divided into five groups based on throughput

Emission Reductions

Group	1	2	3	4	5
gal/mo	13,233	37,500	75,000	150,000	300,000
%	4.7	14.1	45.7	31.3	4.2
EVR* em red (tpd)	0.16	1.33	8.61	11.81	3.19

*Total EVR emission reductions = 25.1 tpd

Cost Effectiveness

Group	1	2	3	4	5
gal/mo	13,233	37,500	75,000	150,000	300,000
%	4.7	14.1	45.7	31.3	4.2
EVR em red (tpd)	0.16	1.33	8.61	11.81	3.19
C.E.* (\$/lb)	\$12.49	\$4.42	\$2.41	\$1.24	\$0.63

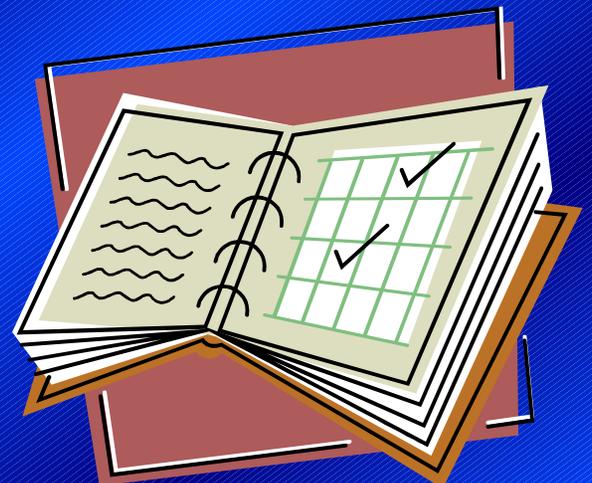
*Overall Cost-Effectiveness = \$1.80/lb

RUST Program

- RUST = Replacement of Underground Storage Tanks
- Low-interest loans for small businesses
- Eric Watkins (916) 323-9879
- <http://commerce.ca.gov/small-business/financing/rust.html>

Tech Review Schedule

- Comments by November 16, 2001
- Draft report issued in January 2002
- Workshop on February 5, 2002
- Comments due February 15, 2002
- Completed April 1, 2002



2002 Regulation Amendments

- Workshop in May 2002 (tentative)
- Finalize amendments in July 2002
- September 2002 Board meeting (tentative)

EVR Phase I Problem

- All Phase I components defined in CP-201 as non-system-specific
- Clear definition needed of what constitutes a Phase I system
- More clarity needed on testing of non-system-specific components

Proposed Solution

- Determine which Phase I components should be reclassified as system-specific
- Propose modification of CP-201, Tables 16-1 and 16-2, to change the designation of those components

System-Specific Phase I

- Components directly involved in fuel deliveries to be reclassified
 - **Spill containment box drain valve**
 - **Drain valve configuration**
 - **Product and Vapor Adaptor**
 - **Drop tube overflow prevention device**

Non-System-Specific Testing Requirements

- All components must successfully complete an operational test of at least 180 days on a certified system to be considered
- Additional bench and/or field testing as necessary to demonstrate compatibility with additional system

EVR Contacts

- **Tech Review** - Cindy Castronovo
 - ccastron@arb.ca.gov (916) 322-8957
- **In-Station Diagnostics** - Tom Scheffelin
 - tscheffe@arb.ca.gov (916) 322-8922
- **EVR Certification and Phase I System Definition** - Laura McKinney
 - lmckinne@arb.ca.gov (916) 327-0900