

Enhanced Vapor Recovery Rulemaking Workshop



March 2, 2010

***California Air Resources Board
(ARB)***

Presentation Outline

1. Workshop Objectives
2. Four-Year Clock
3. Pressure Requirements
4. Low Permeation Hoses
5. Non-Vapor Recovery Nozzles
6. Administrative Amendments
7. Projected Timeline

Workshop Objectives

- Inform stakeholders of several ARB staff regulatory concepts designed to improve the EVR program at Gasoline Dispensing Facilities (GDF)
- Solicit stakeholder input on these concepts, allowing staff to develop an improved proposal for formal rulemaking

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Four-Year Clock

- State law allows existing equipment to stay in use for four years after the effective date of new standards or specifications
 - “Whenever the state board...revises performance or certification standards... any systems or any system components certified and... installed prior to the effective date may continue to be used in gasoline marketing operations for a period of four years after the effective date of the revised standards...”
 - CA Health and Safety Code, §41956.1

Four-Year Clock (cont.)

- D-200 includes definition of “Effective Date”
 - “the date on which a provision has the effect of state law. The effective date starts the clock for the period of continuing use of installed vapor recovery systems/equipment under Health and Safety code 41956.1. The period may be up to four years after which the component and/or system may no longer be used”

Four-Year Clock (cont.)

- EVR effective dates are set in anticipation of available equipment
 - Amended several time in an attempt to keep the effective date at least four years after certification of first system
 - Typically amended by Exec Order followed by rulemaking
 - Process led to some uncertainty as to the final EVR upgrade deadline
- Certified systems may not always be applicable to all GDFs

Four-Year Clock (cont.)

- Existing GDFs should have four years to upgrade from the date a system is certified
- Staff proposes that “Effective Date” automatically becomes the system certification date in cases where the first system is certified after the original effective date

Four-Year Clock (cont.)

- Staff proposes the Executive Officer has authority to extend the effective date for subgroups of GDFs that are not compatible with the certified system
 - Example: GDF with bulk loading operations
- Staff proposes the decision to delay effective date for GDF subgroups is based on engineering evaluation
 - Could be prompted by industry, ARB staff, etc.

Comments

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Pressure Requirements

- Proposal to remove certification pressure limits
 - Retain fugitive emission standard
- Proposal to remove winter in-station diagnostic (ISD) alarms
 - Provide relief for GDFs with winter pressure alarms
 - No emissions increase

Pressure Requirements

Remove Certification Pressure Limits

- Remove current 30 day pressure limits:
 - Average 0.25 inches water column gauge (in wcg)
 - 1.5 in wcg average daily high hour
- Retain fugitive emission limit
 - 95% control is 0.38 lb/kgal
 - Fugitives must be less than half, 0.19 lb/kgal

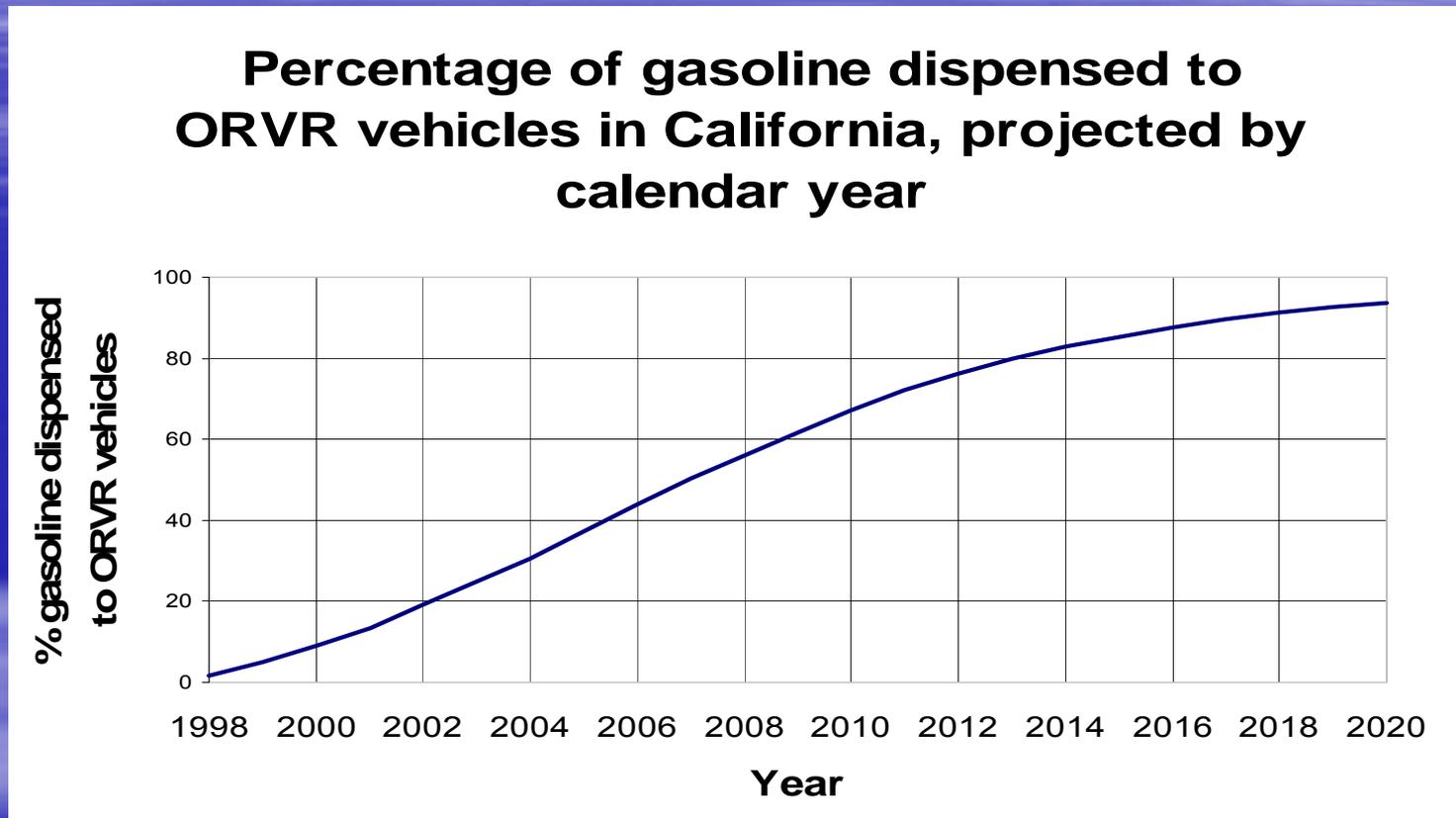
Pressure Requirements

Remove Certification Pressure Limits (cont.)

- Change: Dispensing to vehicles with on-board refueling vapor recovery (ORVR)
 - Introduced for some 1998 models
 - On all new vehicles by model year 2006
 - In-use ARB and EPA testing shows about 98% efficiency

Pressure Requirements

Remove Certification Pressure Limits (cont.)



Source: ARB Emission Factors (EMFAC) 2007 model, 12/14/09

Pressure Requirements

Remove Certification Pressure Limits (cont.)

- Dispensing to ORVR vehicles changes UST pressure
 - Vacuum in underground storage tank (UST) during station operating hours
 - Air is added to UST as a result of ORVR fueling:
 - Overnight: increased evaporation in UST
 - Reduced hydrocarbon concentration in fugitives

Pressure Requirements

Remove Certification Pressure Limits (cont.)

Fugitive emissions calculated for an example station

Average pressure in wcg	Hydrocarbon concentration (volume %)	“Effective” Fugitive Limit lb/kgal
0.25	40%	0.16
	34%	0.14
	25%	0.10

Pressure Requirements

Remove Certification Pressure Limits (cont.)

- Remove the following from CP-201 (vapor recovery equipment for USTs):
 - Section 4.6.5: A rolling 30 day average of the daily average pressures and the daily high pressures for each day shall be calculated [and] meet the following criteria:
 - The daily average pressure shall not exceed + 0.25 in H₂O
 - The daily high pressure shall not exceed + 1.5 in H₂O

Pressure Requirements

Remove Winter ISD Pressure Alarms

- Two pressure assessments designed to generate alarms:
 - 1.5 in wcg exceeded for more than 5% of the time in a week (gross failure)
 - 0.5 in wcg exceeded for more than 25% of the time in a month (degradation)
- First alarm → warning
- Second consecutive alarm → GDF shutdown

Pressure Requirements

Remove Winter ISD Pressure Alarms (cont.)

- 10,300 GDFs with EVR Phase II
- 8,000 GDFs projected to have ISD
- Many have no winter pressure alarms and no need for this ISD change
- Staff proposal will provide relief to those GDFs with pressure alarms

Pressure Requirements

Remove Winter ISD Pressure Alarms (cont.)

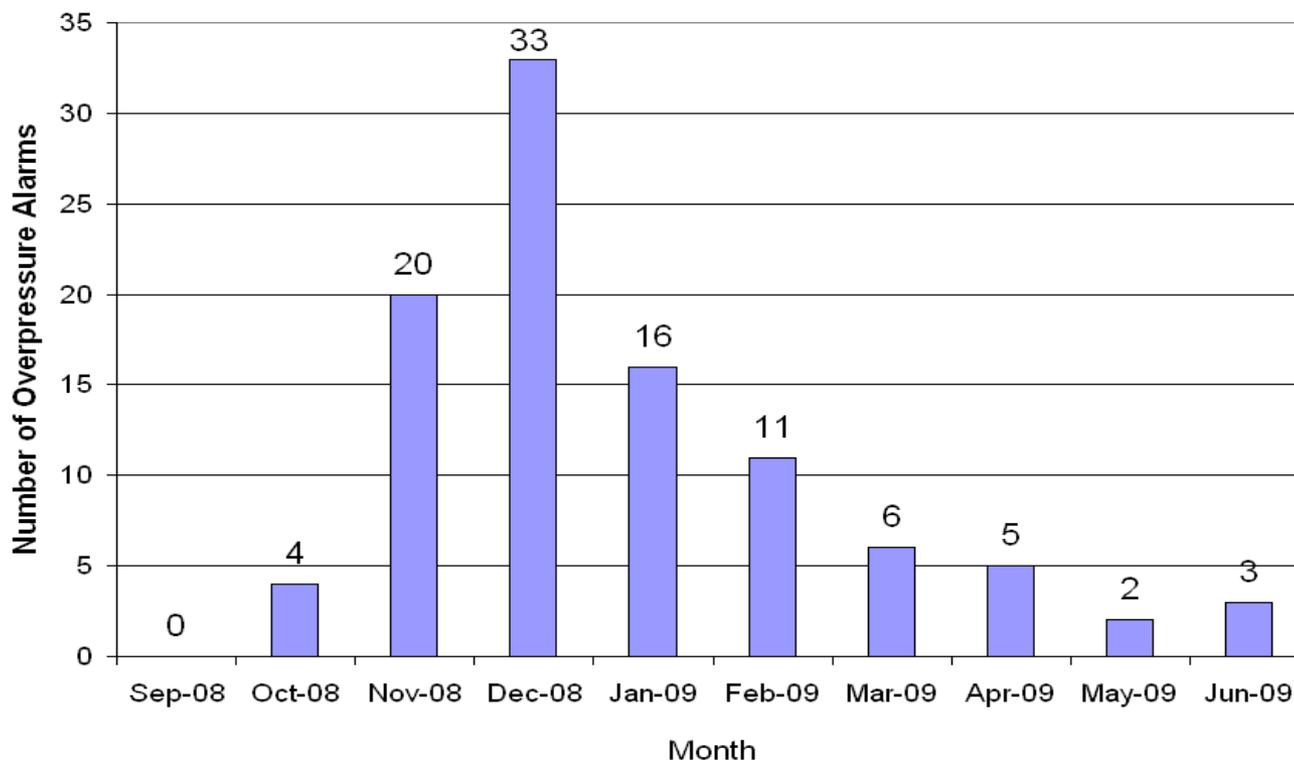
- Proposal to remove requirement for ISD pressure assessments and alarms during winter months of November through February
- Parameters that affect pressure in the tank
 - Gasoline volatility
 - Gasoline throughput
 - Operating hours
 - Dispensing to ORVR vehicles

Pressure Requirements

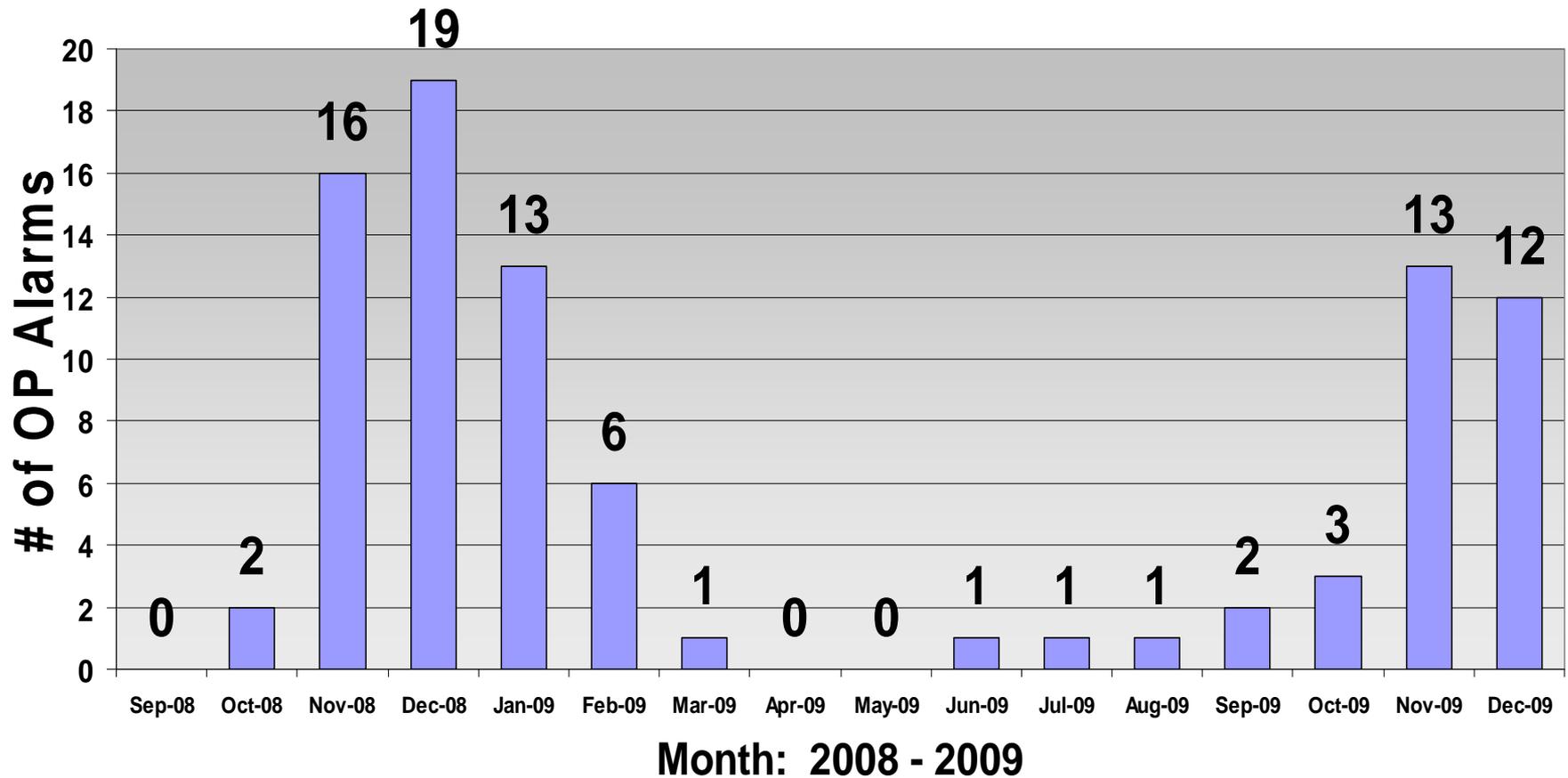
Remove Winter ISD Pressure Alarms (cont.)

- Pressure from overnight evaporation of gasoline
- Nov through Feb – Reid Vapor Pressure (RVP) of gasoline increases and causes increased evaporation / pressure in UST
- ARB studies: High RVP fuel in November – February correlates with pressure alarms

Overpressure Alarms by Month for 37 GDFs (Winter of 08-09)



2008 - 2009: Pressure Alarms by Month for 16 GDFs



Pressure Requirements

Remove Winter ISD Pressure Alarms (cont.)

- Winter pressure alarms require service calls
- No equipment failure/no equipment repair
- If no repair then no emission reductions for the alarm or service call
- Annual estimated cost for alarm response: \$6 to 10 million

Pressure Requirements

Remove Winter ISD Pressure Alarms (cont.)

- ARB Advisory 405 to Districts on Enforcement for ISD alarm response
 - First warning alarm: Service call required, then 30 day “Free Pass”
 - If second alarm after 30 days, service call required, then “Free Pass” to April 1

Pressure Requirements

Remove Winter ISD Pressure Alarms (cont.)

- Proposal: Remove ISD pressure profile assessments and alarms in ARB's Vapor Recovery Certification Procedure (CP-201)
 - Effective November 1 to February 28 only
 - Despite alarms, no equipment failure
 - Removal of alarms does not affect operation of processors
 - Therefore, this action does not increase emissions

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Low Permeation Hoses

- GDF Hose Background
- Inventory Development
- Proposal
- Important Dates

Low Permeation Hoses

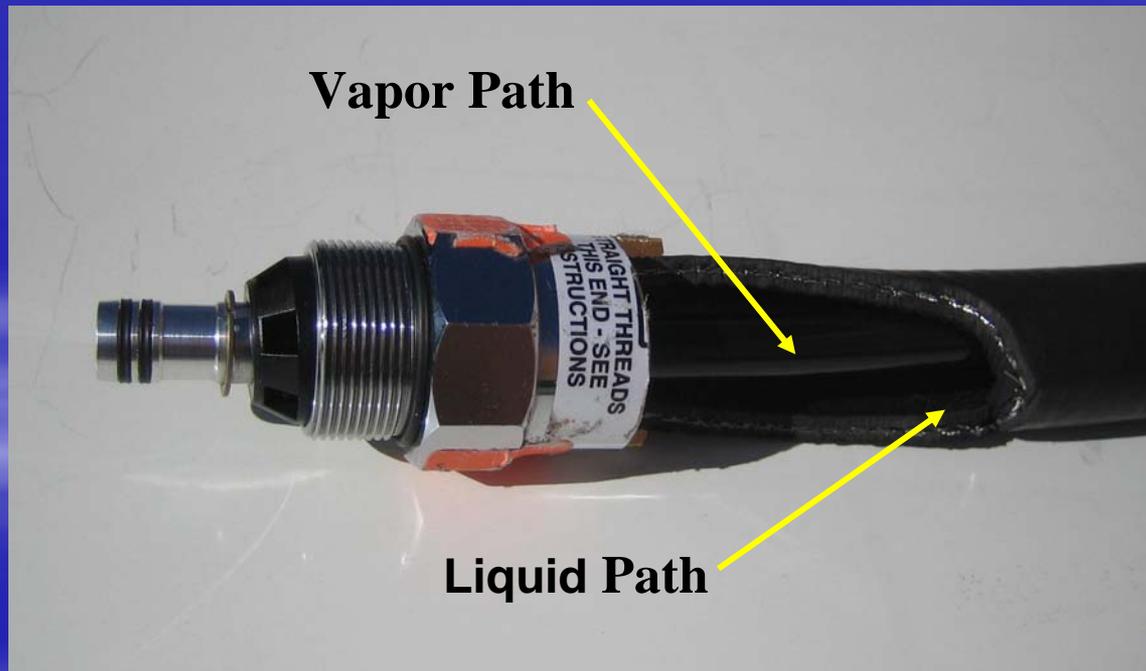
GDF Hose Background

- ARB certifies GDF hoses as part of an Enhanced Vapor Recovery (EVR) system
 - EVR systems require the use of vapor recovery hoses
 - Currently, there is no regulatory standard for emissions from GDF hoses in California

Low Permeation Hoses

GDF Hose Background (cont.)

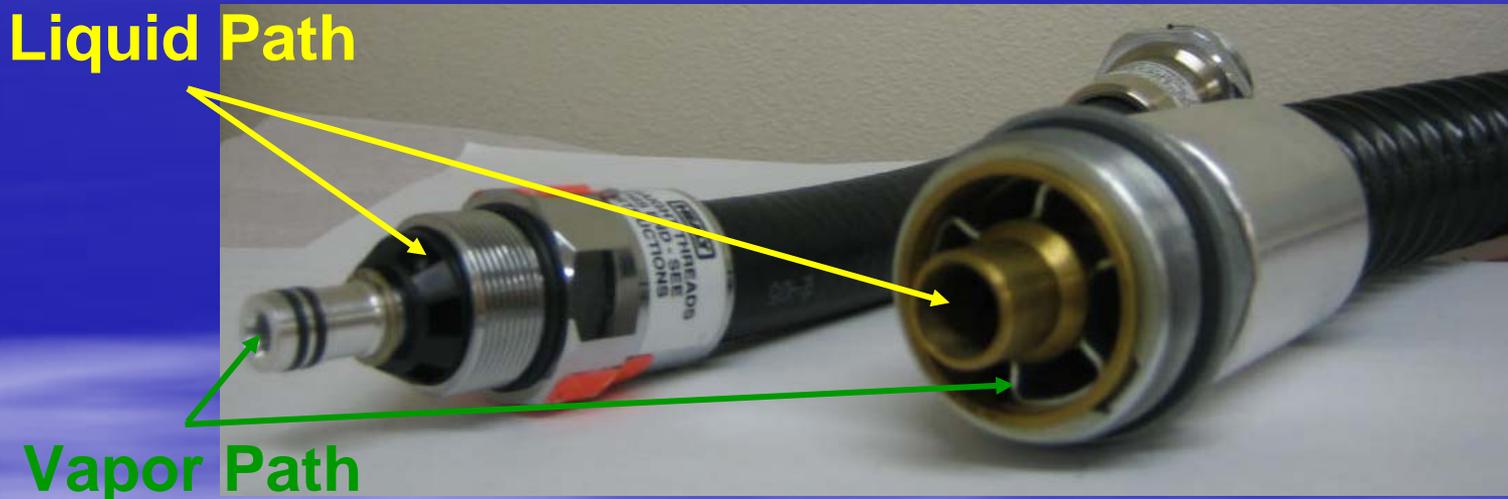
- GDF vapor recovery hoses differ from other types of conventional fuel hose in that they are co-axial



Low Permeation Hoses

GDF Hose Background (cont.)

- There are two configuration types of GDF vapor recovery hose



**Vacuum Assist
Hose**

**Balance
Hose**

Low Permeation Hoses

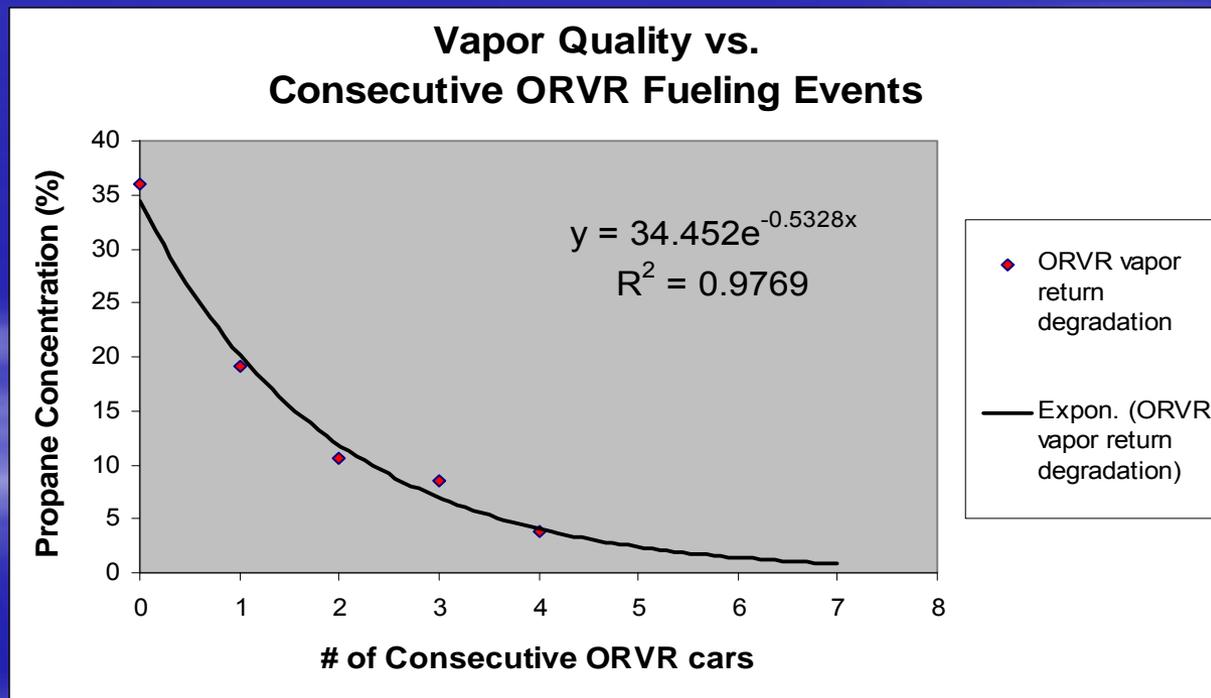
Inventory Development

- There are many factors that effect hose permeation rates:
 - Temperature
 - Hose material
 - Fuel type
 - Fuel degradation (weathering)
- Due to the coaxial design of vapor recovery hoses, it is necessary to modify conventional fuel hose permeation test standards

Low Permeation Hoses

Inventory Development (cont.)

- Increasing ORVR market penetration will decrease permeation emissions in balance style GDF hoses
 - These hoses carry vapor in their outer paths



Low Permeation Hoses

Inventory Development (cont.)

- In 2004, 2008, and 2009, ARB conducted testing to determine permeation rates of vapor recovery hoses



Low Permeation Hoses

Inventory Development (cont.)

- Based upon ARB testing, Staff estimates the following GDF hose permeation rates given an average temperature of 73°F using CaRFG 3 fuel with 6% ethanol:
 - Vacuum assist hose: 80 g/m²/day
 - Balance hose*: 114 g/m²/day

**Assumes vapor is saturated.*

Low Permeation Hoses

Inventory Development (cont.)

- Following recent market shifts associated with 2009 EVR compliance deadlines, staff estimates a current population of
 - ~96,000 hoses employed at GDFs with phase II vapor recovery systems
 - 23% Balance
 - 77% Vacuum Assist
- 2016 uncontrolled summertime GDF hose emissions
 - Vacuum Assist: 2.0 tons/day
 - Balance: 0.2 tons/day

Low Permeation Hoses

Proposal

- ARB staff intends to incorporate a low permeation GDF hose performance standard into CP-201, ARB's Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities
- Additionally, ARB staff intends to incorporate a low permeation GDF hose performance standard into CP-206, ARB's Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities Using Aboveground Storage Tanks

Low Permeation Hoses

Proposal (cont.)

- Staff proposes that this permeation standard only be applied to hoses that carry liquid gasoline against the outer hose wall
- Additionally Staff proposes to certify low permeation GDF hoses that do not have vapor return paths (conventional GDF hoses)

Low Permeation Hoses

Proposal (cont.)

- Staff proposes that the allowed hose permeation rate will be less than 10 g/m²/day as measured in accordance with either:
 - UL 330 (7th edition)
 - Section 15, Permeation Test
 - Proposed ARB TP 201.8
- Staff estimates these standards will reduce emissions from GDF hoses by at least 96%

Low Permeation Hoses

Proposal (cont.)

- In 2007 ARB conducted a survey of hose manufacturer's to determine the cost increase to upgrade GDF hoses with low permeation technology
- The average cost increases were as follows:
 - \$10 for conventional and vacuum assist hose
 - \$29 for balance hose
- For more details, see full report posted at:
http://www.arb.ca.gov/vapor/qdfhe/GDF_hose_upgrade_cost_report_draft.pdf

Low Permeation Hoses

Proposal (cont.)

- Estimated cost-effectiveness of proposal:
 - 0.03 \$/lb of emissions reduced (savings)
- Assumptions:
 - Baseline hose emissions of 80 g/m²/day (73°F)
 - Permeation limit of 10 g/m²/day (100°F)
 - Gasoline savings at \$3 per gallon
 - Cost increase of \$10 per hose
 - Average hose life of 2 years

Low Permeation Hoses

Important Dates

- January 1, 2012
 - Date new facilities, and existing facilities undergoing major renovations, must meet low perm GDF hose requirements
- January 1, 2016
 - Date existing facilities must meet low perm GDF hose requirements

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Non-Vapor Recovery Nozzles

- ARB guidance encourages Air Districts to allow ORVR fleet GDFs to operate without Phase II EVR
 - 2/20/2008 Letter from ARB to Districts
 - Consistent with U.S. EPA Memo
- Typically applied to car rental, corporate or government fleet fueling facilities
- Approximately 200 facilities in CA

Non-Vapor Recovery Nozzles (cont.)

- Since these facilities are exempt from Phase II EVR, what standards apply?
 - Conventional nozzle (no vapor return path)
 - Phase II EVR nozzle with return path capped
- New standards would provide clarity and emission reductions

Non-Vapor Recovery Nozzles (cont.)

Performance Type	Requirement	Sec.	Std Spec.	Test Procedure
Nozzle Spillage Including Drips from Spout	≤ 0.24 pounds/1,000 gallons	9.1	Std.	TP-201.2C
Nozzle Criteria	Post-Refueling Drips ≤ 3 Drops/Refueling Have an OD ≤ 0.840 inches for 2.5 inches Be capable of fueling any vehicle that can be fueled with a conventional nozzle	9.2	Spec.	TP-201.2D Engineering Evaluation
Nozzle Spitting	≤ 1.0 ml / nozzle/fueling	9.3	Spec.	TP-201.2E, Sect. 6.4

Non-Vapor Recovery Nozzles (cont.)

- Incorporates relevant Phase II EVR standards and specifications
- Nozzle spitting criteria would likely necessitate some form of interlock
 - Nozzle boot may be needed for interlock
- Costs are under review at this time
 - More than current conventional nozzles
 - Less than EVR nozzles

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Administrative Amendments

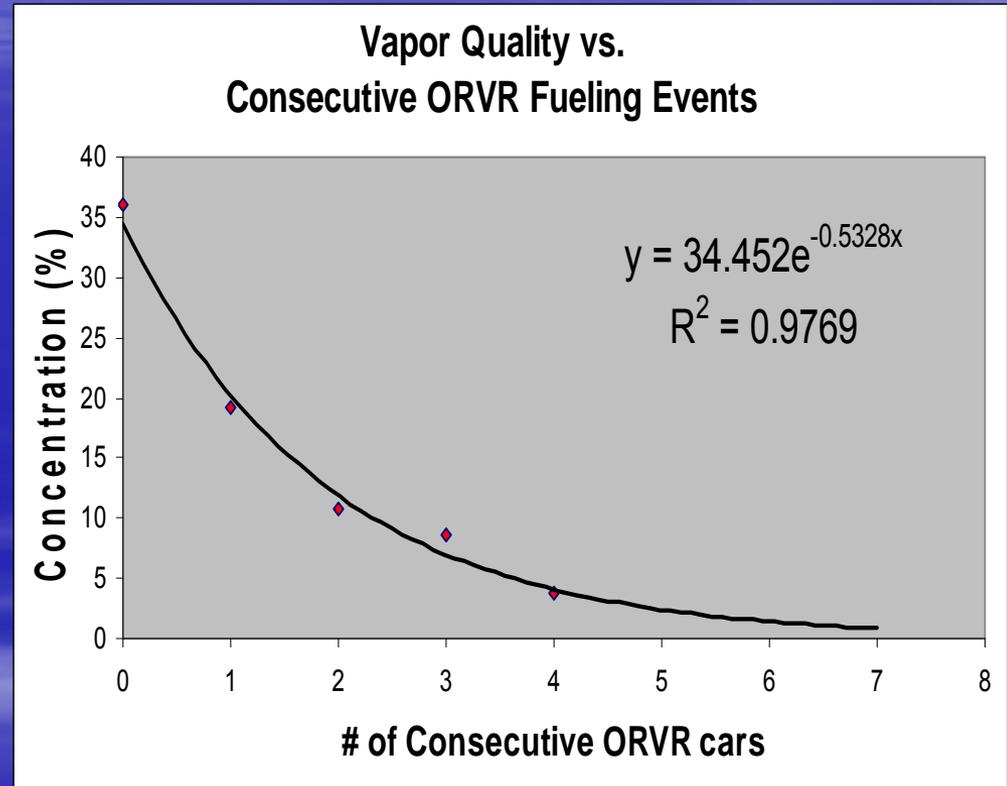
- Amendments to D-200, CP-201, CP-206, and various Test Procedures
- Eliminate inconsistencies
- Correct known errors
- Define equivalent procedures where appropriate

Administrative Amendments (cont.)

- Delete the Definition of “Fugitive Emissions” from D-200
- Amend the definition of “Pressure Related Fugitive Emissions” in D-200 to reference fugitive emissions as calculated in TP 201.2F

Administrative Amendments (cont.)

- Amend CP-201 efficiency testing of Phase II systems to a matrix of 100 non-ORVR vehicles, exclude ORVR vehicles.
- Amend TP 201.2A (Vehicle Matrix) to reflect CP changes



Administrative Amendments (cont.)

- Retain 95% efficiency and 0.38 lb/kgal emission factor for non-ORVR vehicles (*CP 201, sec 4.1.1*)
- Exclude requirement to show that an entire population of non-ORVR and ORVR vehicles meet 0.38 lb/kgal
- Exclude requirement to show that vehicles defined as ORVR vehicles meet 0.38 lb/kgal
- Amend TP-201.2C (Spillage from Phase II Systems) to include a determination that the Phase II nozzle is compatible with ORVR vehicles.

Administrative Amendments (cont.)

- Remove ISD Requirements for ASTs
 - Few ASTs meet ISD throughput requirement of 600,000 gallons per year
- Amend vehicle matrix for CP 206
 - Mirror CP-201 matrix, no ORVR vehicles, but with 30 vehicles instead of 100
- Amend CP 206 to specify minimum throughput of 9000 gal during certification

Administrative Amendments (cont.)

- Include several equivalent test procedures in TP-201.2
 - Refer to Aug 28, 2007 memo for a discussion of each item that will be amended
- Amend specifications for data collection systems in TP 201.7
 - Less prescriptive, allow for more updated equipment and software

Administrative Amendments (cont.)

- Clean up test equipment specifications and calibration requirements
- Make range and accuracy requirements consistent throughout various TPs
- Distinguish between certification and compliance testing requirements
 - Minimize number of instruments and complexity of calibration for contractors

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Projected Timeline

- April / May 2010 – Second Workshop
- June / July 2010 – Formal Notice of Proposed Rulemaking
- August / September 2010 – Board Presentation

Contact Information

- Staff Lead: Scott Bacon
 - (916) 322-8949, sbacon@arb.ca.gov
- Project Manager: Dennis Goodenow
 - (916) 322-2886, dgoodeno@arb.ca.gov
- For questions on Pressure Requirements:
Frances Cameron, P.E.
 - (916) 445-9314, fcameron@arb.ca.gov
- For questions concerning GDF hose emissions:
Jason McPhee, P.E.
 - (916) 322-8116, jmcphee@arb.ca.gov

Web Site

<http://www.arb.ca.gov/vapor/rulemaking.htm>

