

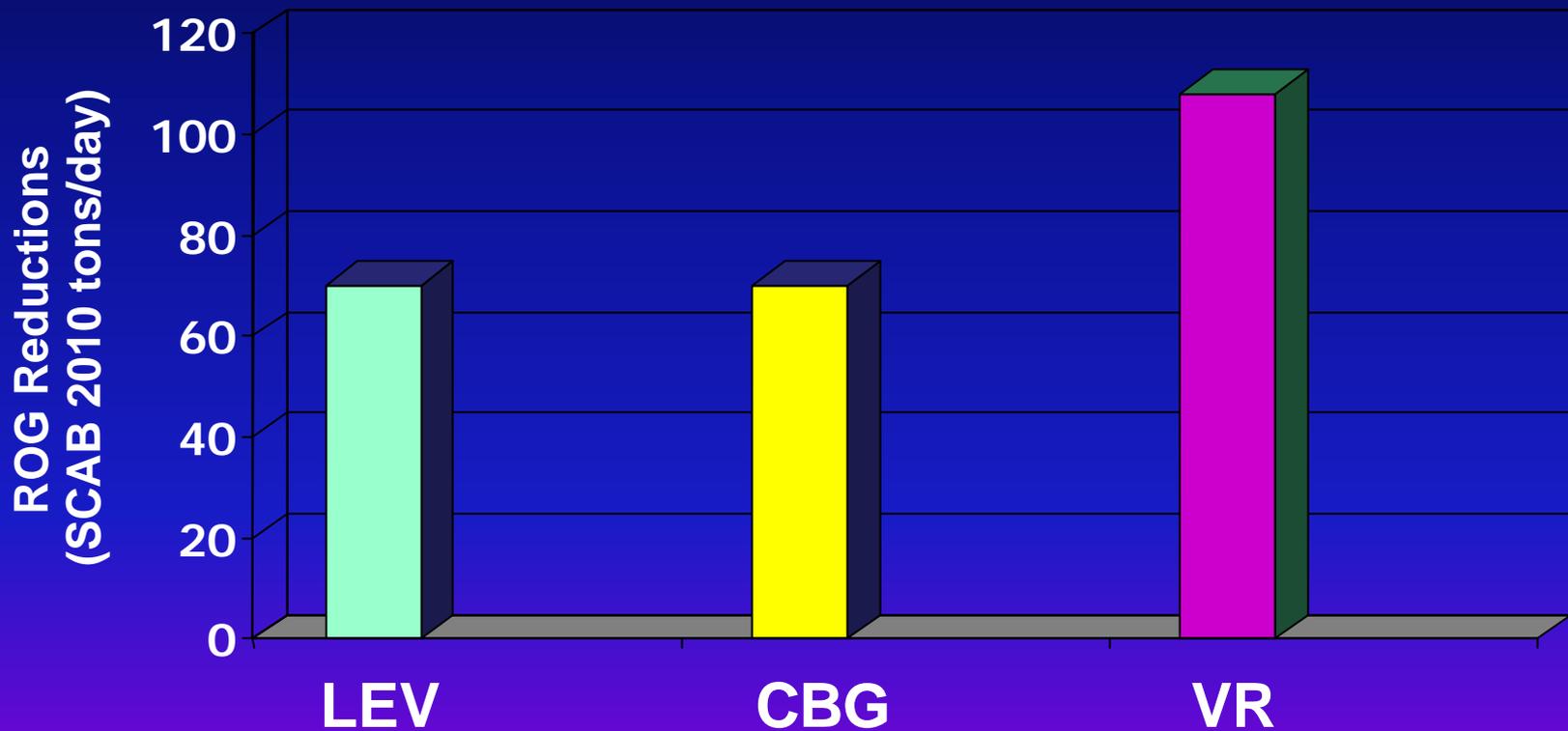
# Enhanced Vapor Recovery

California Air Resources Board



# Vapor Recovery Provides Large Emission Reductions

---



# EVR Goals and Strategy

---

## Goals

- Increase in-use performance of service station vapor recovery systems
- Additional emission reductions

## Strategy

- Fix existing problems (short-term)
- EVR proposal (long-term)

# EVR Improves Existing Systems and Goes Beyond Today's Standards

---

Enhanced Vapor Recovery

Current Standards

Existing System Performance



25 tpd

# Activities Addressing Currently Installed Systems

---

- Parts houses enforcement
- Maintenance manuals
- Considering decertification of some problem equipment
- Simple inspection procedures

# Summary of the Proposed Amendments

---

Module 1: Phase I vapor recovery

Module 2: Phase II vapor recovery

Module 3: ORVR compatibility

Module 4: Liquid retention and spitback

Module 5: Spillage and dripless nozzles

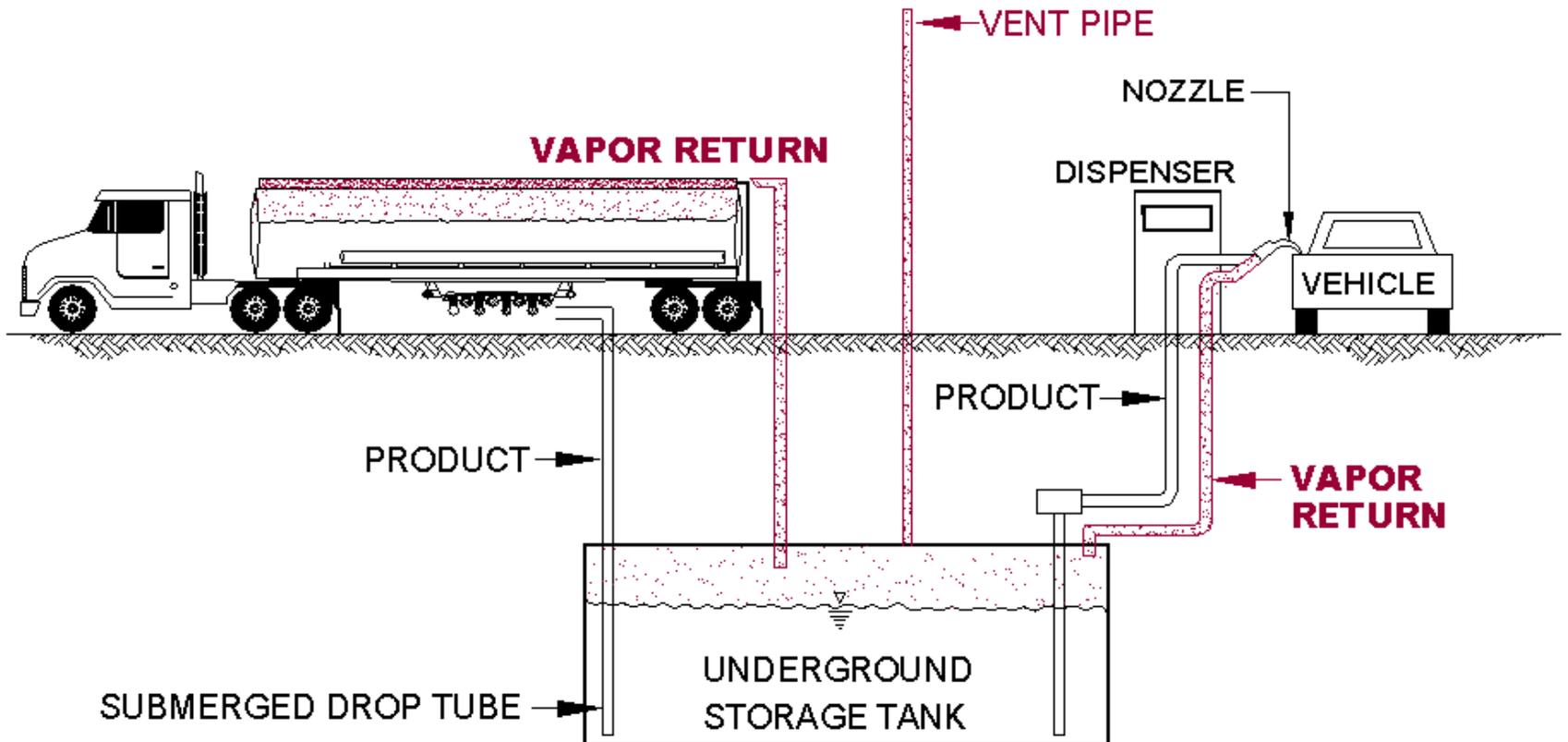
Module 6: In-Station diagnostics

Certification Changes

# Phase I and Phase II Vapor Recovery Systems at Service Stations

## PHASE I SYSTEM

## PHASE II SYSTEM

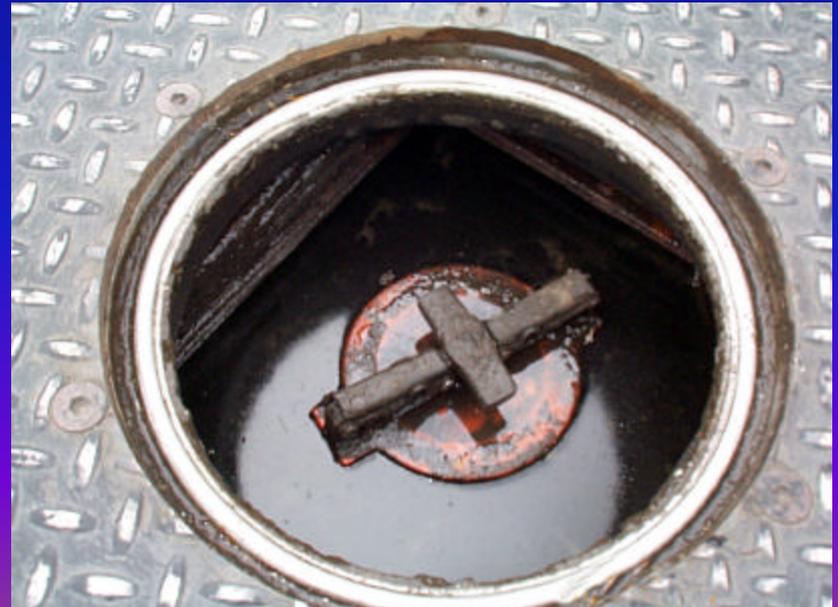


# Module 1

## Phase I Vapor Recovery

---

- Increase Phase I transfer efficiency from 95% to 98%
- Improve equipment components
  - P/V valves
  - Phase I fittings
  - drain valves



# Module 2 Phase II Vapor Recovery

---

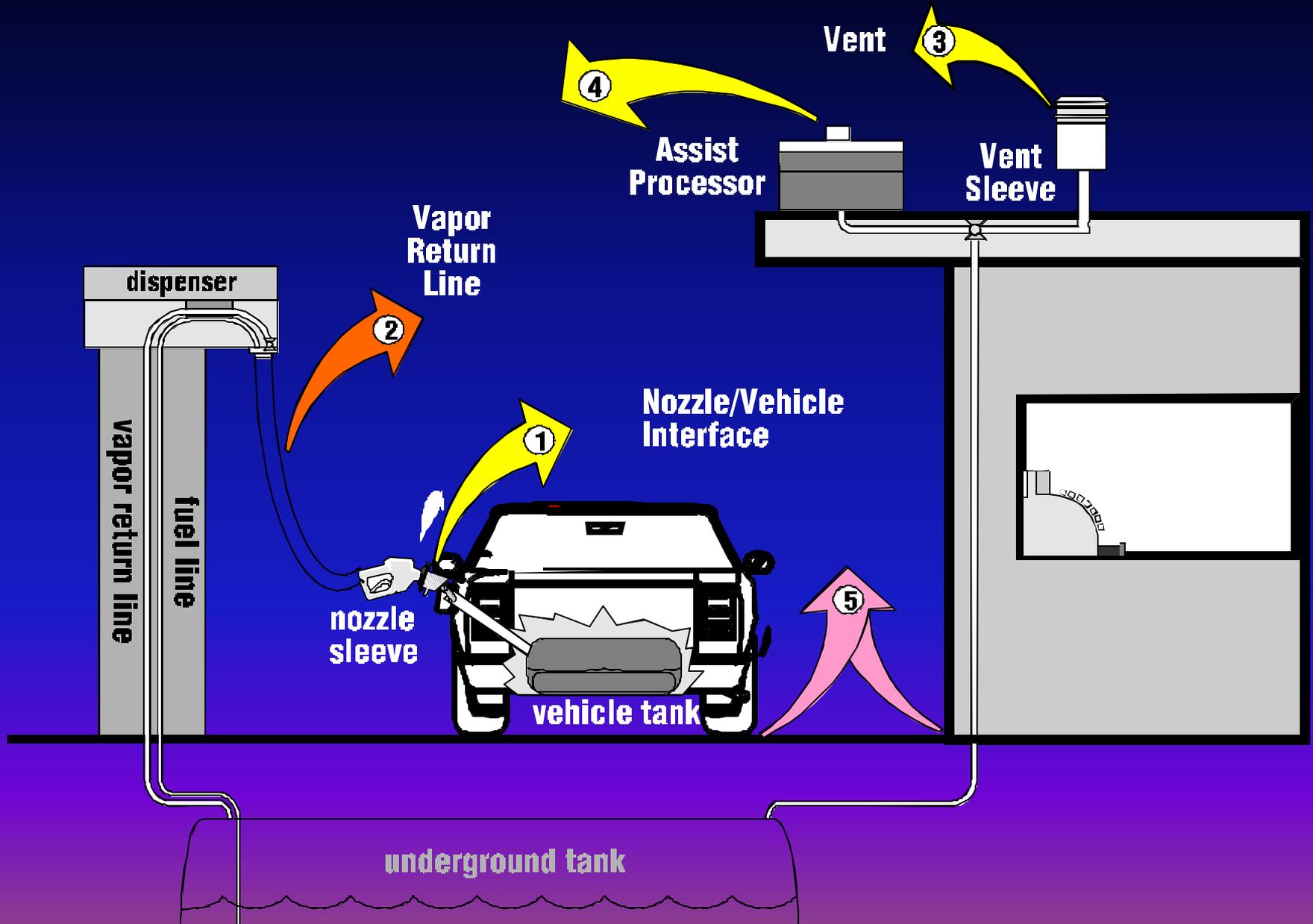
- Numerous significant changes to certification process and standards
  - pressure-related fugitives
  - storage tank pressure limits
  - emission factor
  - component specifications
  - vapor processors
  - component certification

# Phase II

## Balance and Assist Nozzles



# Pressure-Related Fugitives



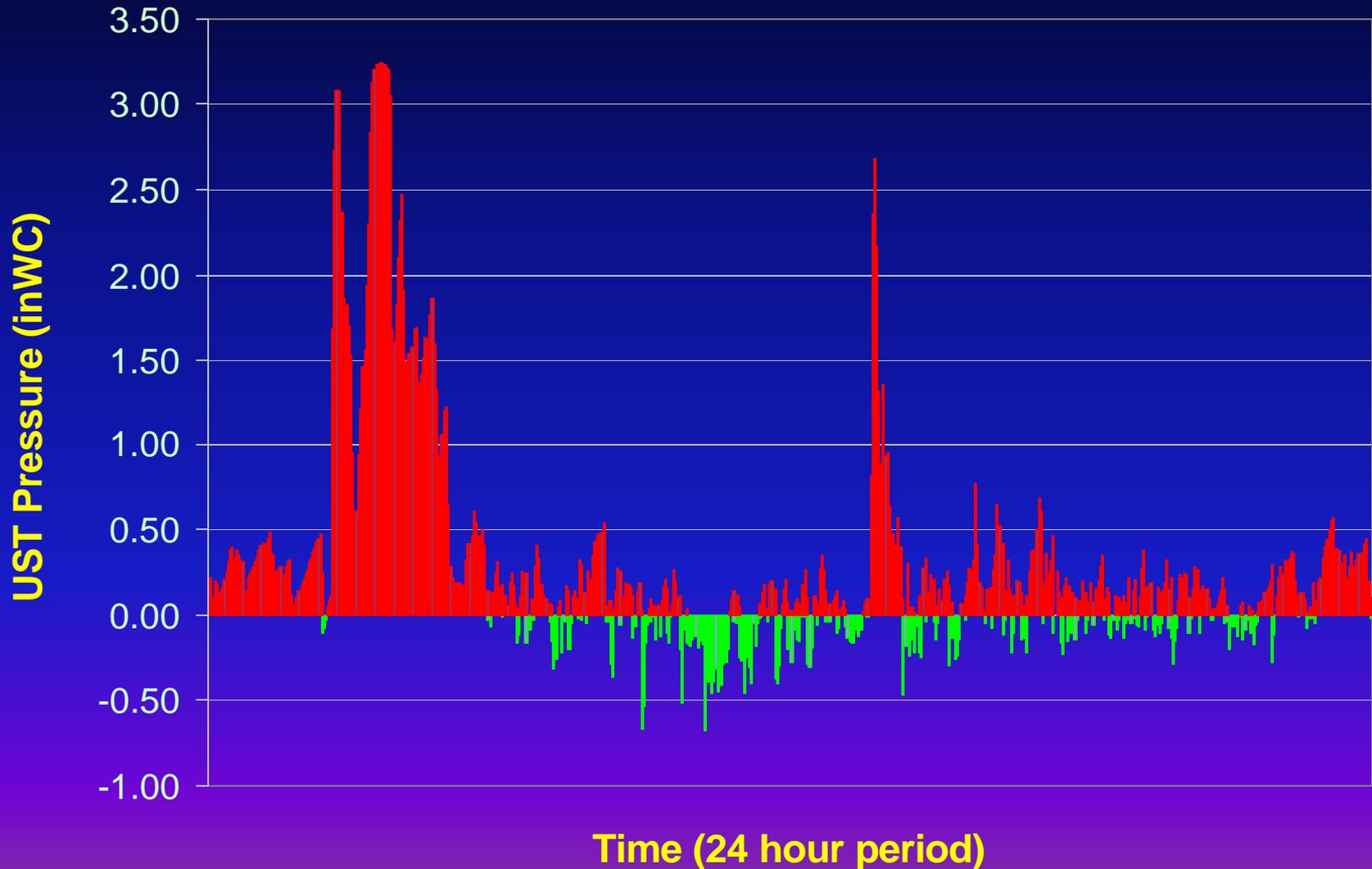
# Underground Storage Tank Pressure Limits

---

- Proposed limits would allow slight positive pressures
  - 30-day average less than 0.25 in water
  - hourly high pressure less than 1.5 in water
  - atmospheric pressure would signal leak
  - exclude periods after bulk drop

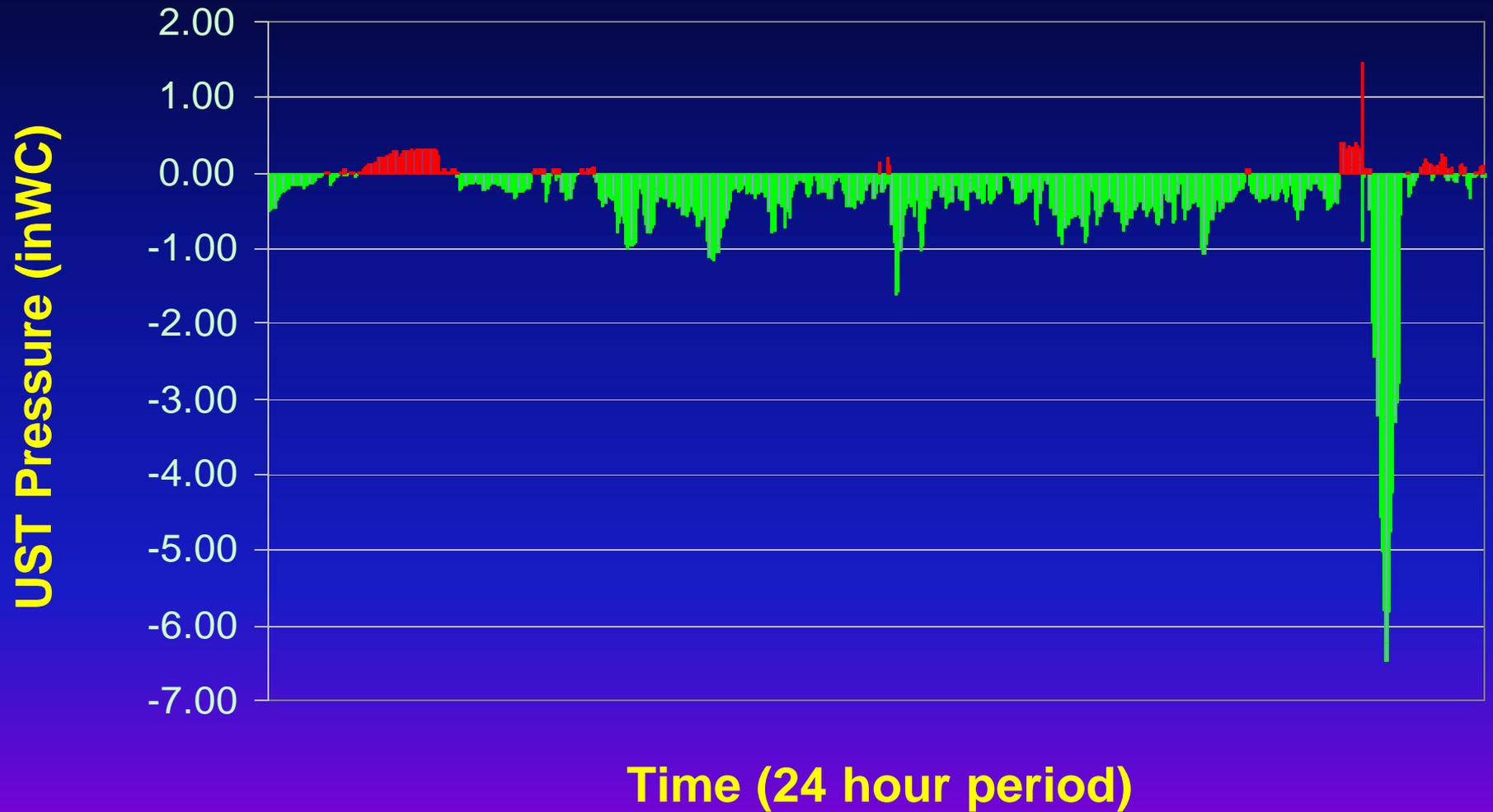
# Pressure Data from Balance Station (as found)

---



# Pressure Data from Balance Station (tight system)

---



# Efficiency vs. Emission Limit

- Original Proposal
  - change from 95% to 0.38 lbs/1000 gallons
- Amended Proposal
  - Summer Certification Testing
    - 0.38 lbs/1000 gallons **AND** 95% efficiency
  - Winter Certification Testing
    - 0.38 lbs/1000 gallons **OR** 95% efficiency

# New Component Standards

---

- Pressure drop budget for balance system components
- Vapor check valves
- Unihose dispenser



# Air Pollutant Emissions from Processors

---

- All Processors
  - max HC rate < 3.8 lb/1000 gal
  - benzene < 7.2 lbs/year
- Destructive Processors
  - 1,3-butadiene < 1.2 lbs/year
  - formaldehyde < 36 lbs/year
  - acetaldehyde < 84 lbs/year



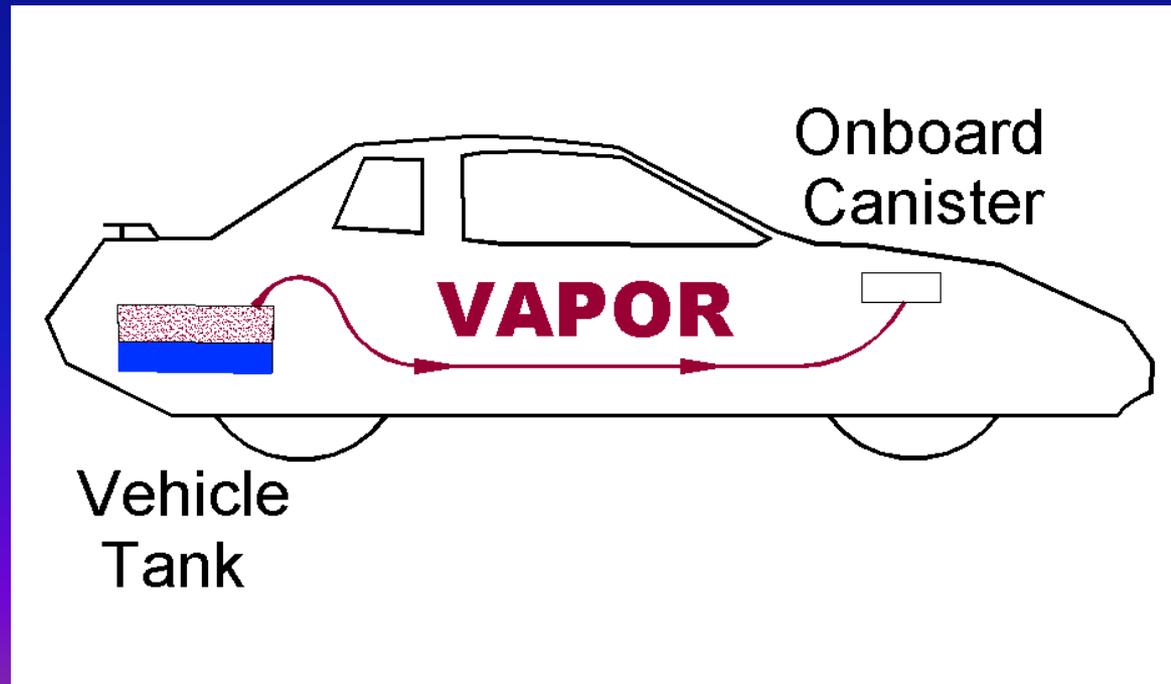
# Component Certification

---

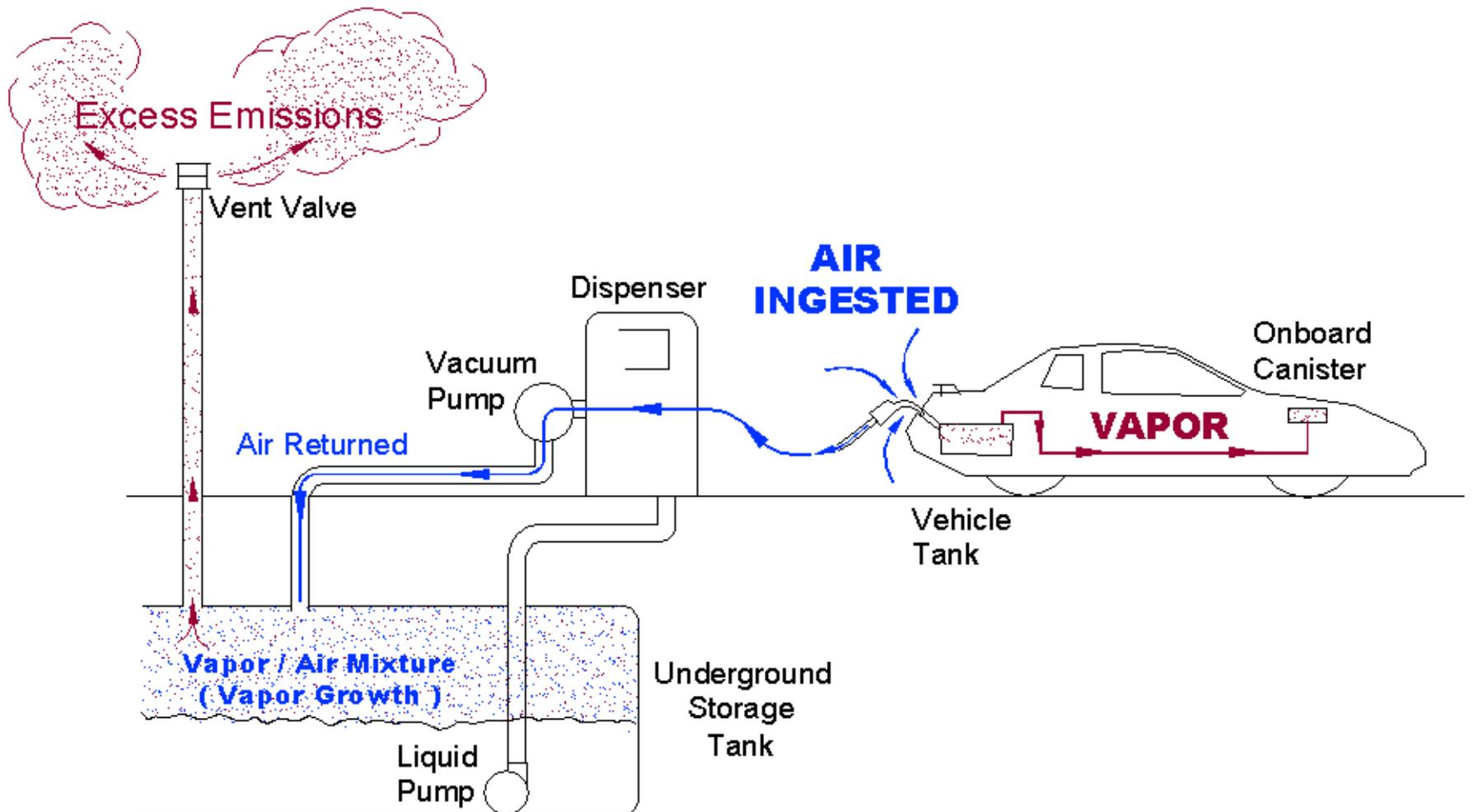
- State law says certify systems
- Test burden for components which can be used on multiple systems
- Non-system specific components
  - defined by performance specifications
- System-specific components
  - full testing per system still required

# Module 3: ORVR Compatibility

- ORVR = Onboard Refueling Vapor Recovery
- Federal requirement



# ORVR/Phase II Compatibility

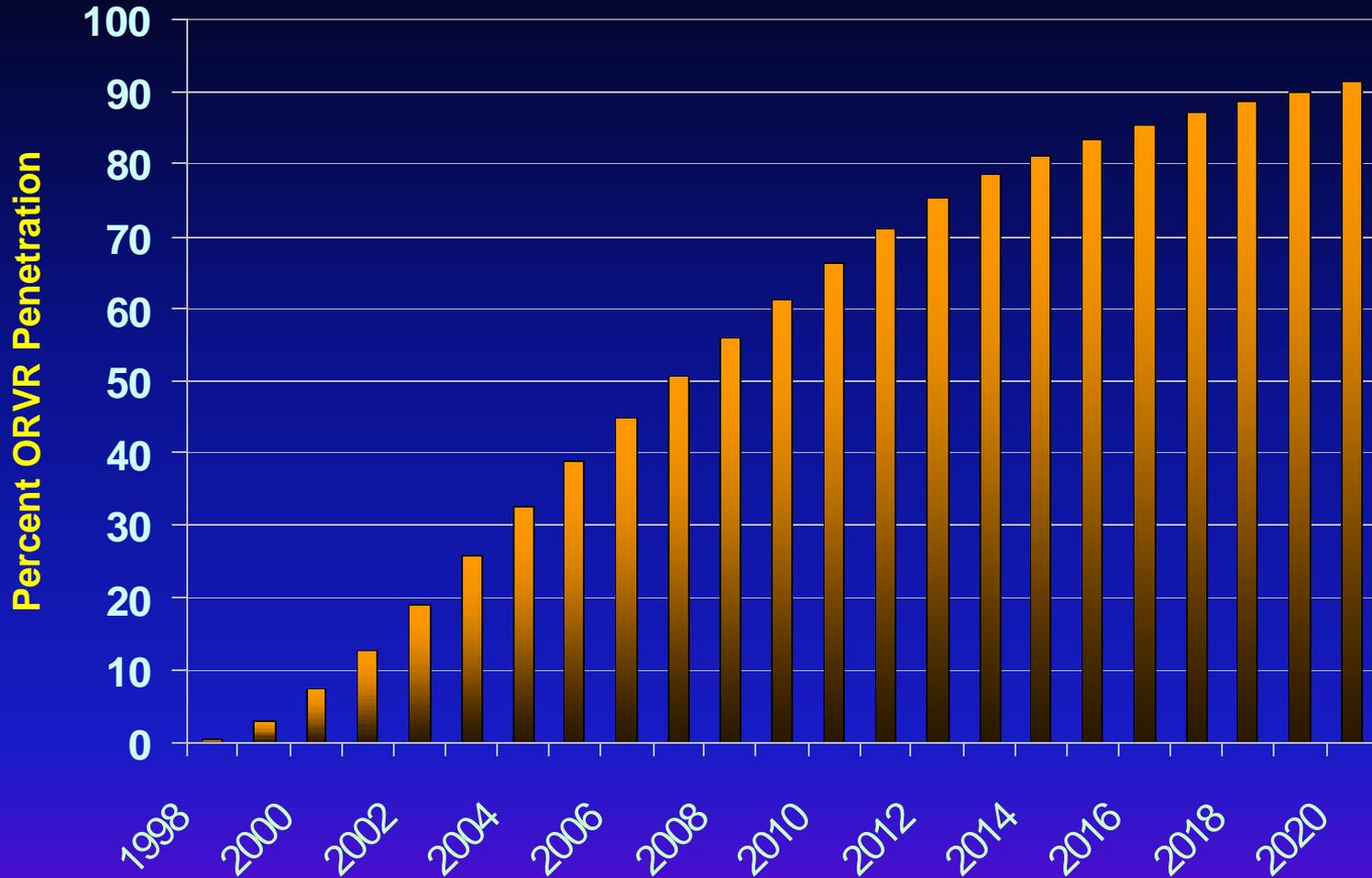


# ORVR Phase-in

---

<b>Vehicle Class</b>	<b>40%</b>	<b>80%</b>	<b>100%</b>
Passenger	1998	1999	2000
LD Trucks & MDV (<6000 lbs)	2001	2002	2003
MD Vehicles (6001-8500 lbs)	2004	2005	2006

# ORVR Penetration Projection



- In 2010, about 66% of gasoline throughput will be dispensed to ORVR vehicles

# Module 3 - ORVR Compatibility

- Require Phase II to have no excess emissions for ORVR fuelings
- Test to be proposed by applicant
- Vehicle-side fix not cost-effective

# Module 4 - Liquid Retention and Nozzle Spitting

---

- New emission category
- Liquid evaporates from hanging hardware between fuelings
- Expected to be technology-forcing
- Proposed phase-in of limits
  - first limit based on better nozzles
- spitting < 1.0 ml/nozzle

# Module 5

## Spillage & Dripless Nozzle

---

- More stringent spillage standard
  - reduce from 0.42 to 0.24 lbs/1000 gal
  - add criteria to limit drips from nozzles after fueling
- Technology forcing

# Module 6 - In-Station Diagnostics

- Current systems can dispense fuel even if vapor recovery not working
- Identify failure modes automatically
- Supplement district inspections
- Concept similar to OBD for vehicles
- Tie-in to existing UST leak monitors

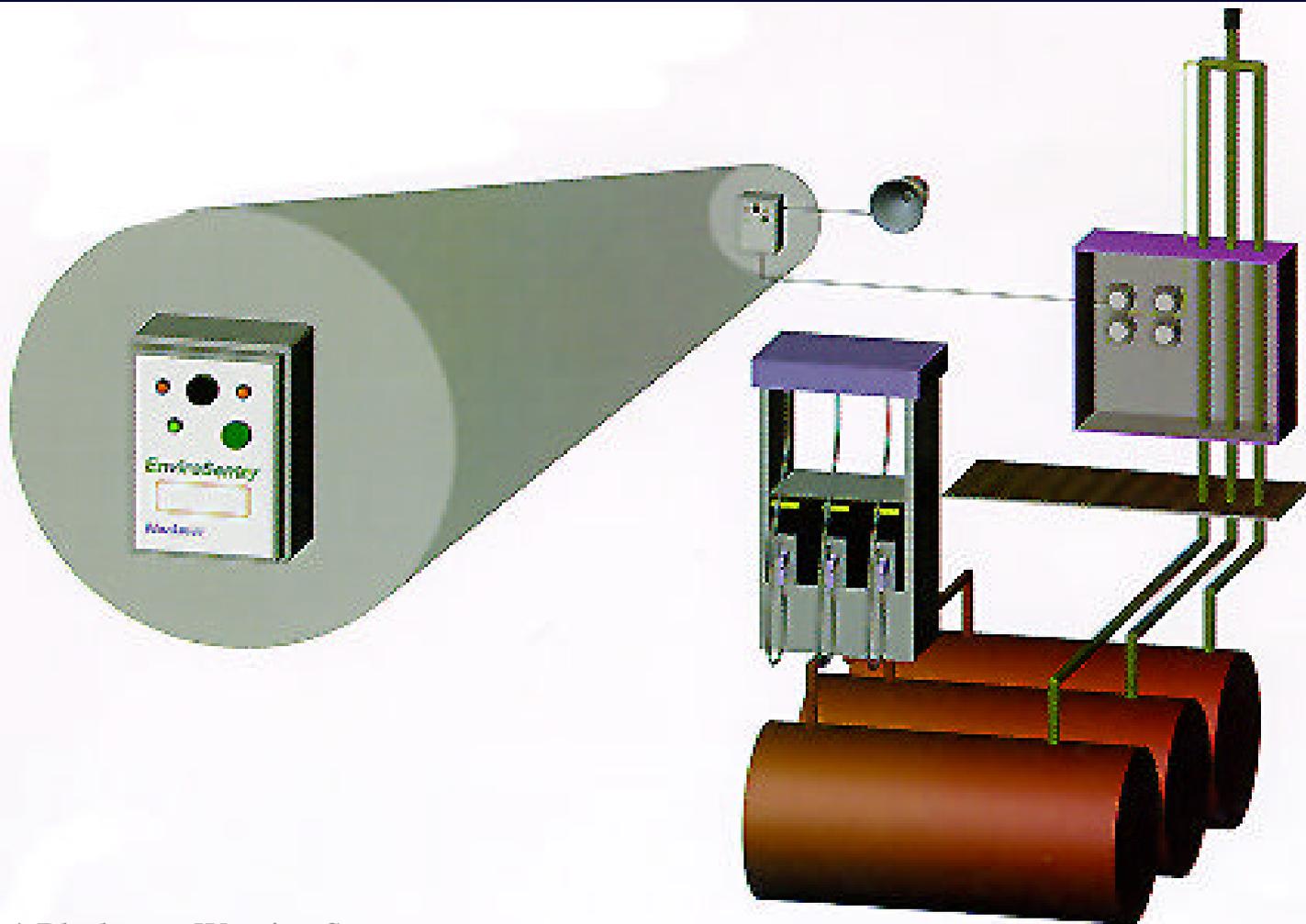
# Module 6 - In-Station Diagnostics

---

- All systems: pressure monitoring
- Balance system
  - blockage in vapor return line
- Assist system
  - vapor pump failure
- Assist systems with processors
  - processor operation

# In-Station Diagnostics

---



\* Blackmere Warning System

# Certification Changes

---

- Application
  - maintenance manuals, test data
  - plan for installer training
- Testing
  - field evaluation increased to 180 days min
  - test matrix increased to 200 cars
- District review
  - application and draft Executive Orders

# Warranty Changes

---

- Additions to warranty tag
  - factory tested statement
  - list of applicable performance standards and specifications
- Performance standards to be met throughout warranty period
- Warranty may be conditioned to use of trained installer

# Limited Term Certification

---

- No expiration date for existing systems
- Proposed 4-year limit
  - renew if no deficiencies identified
  - serious deficiency → decertification
  - minor deficiency → delay renewal
- Installed expired systems can be used for remainder of useful life up to 4 years

# New and Revised Test Procedures

---

- TP-201.2D Drips from Nozzles
- TP-201.2E Liquid Retention
- TP-201.2F Pressure-related Fugitives
- TP-201.2H Processor HAPs
- TP-201.2O Drop Tube Leaks
- Revisions for nine existing procedures for Phase I and Phase II certification
- Repeal of TP-201.3A 5 inch leak test

# State Law Requirements

---

- Change in standard triggers decertification
- Existing vapor recovery systems may be used for 4 years (4-year clock)
- Replacement parts must be certified
- New installations must meet new standards in effect at time of installation

# Technology Review

---

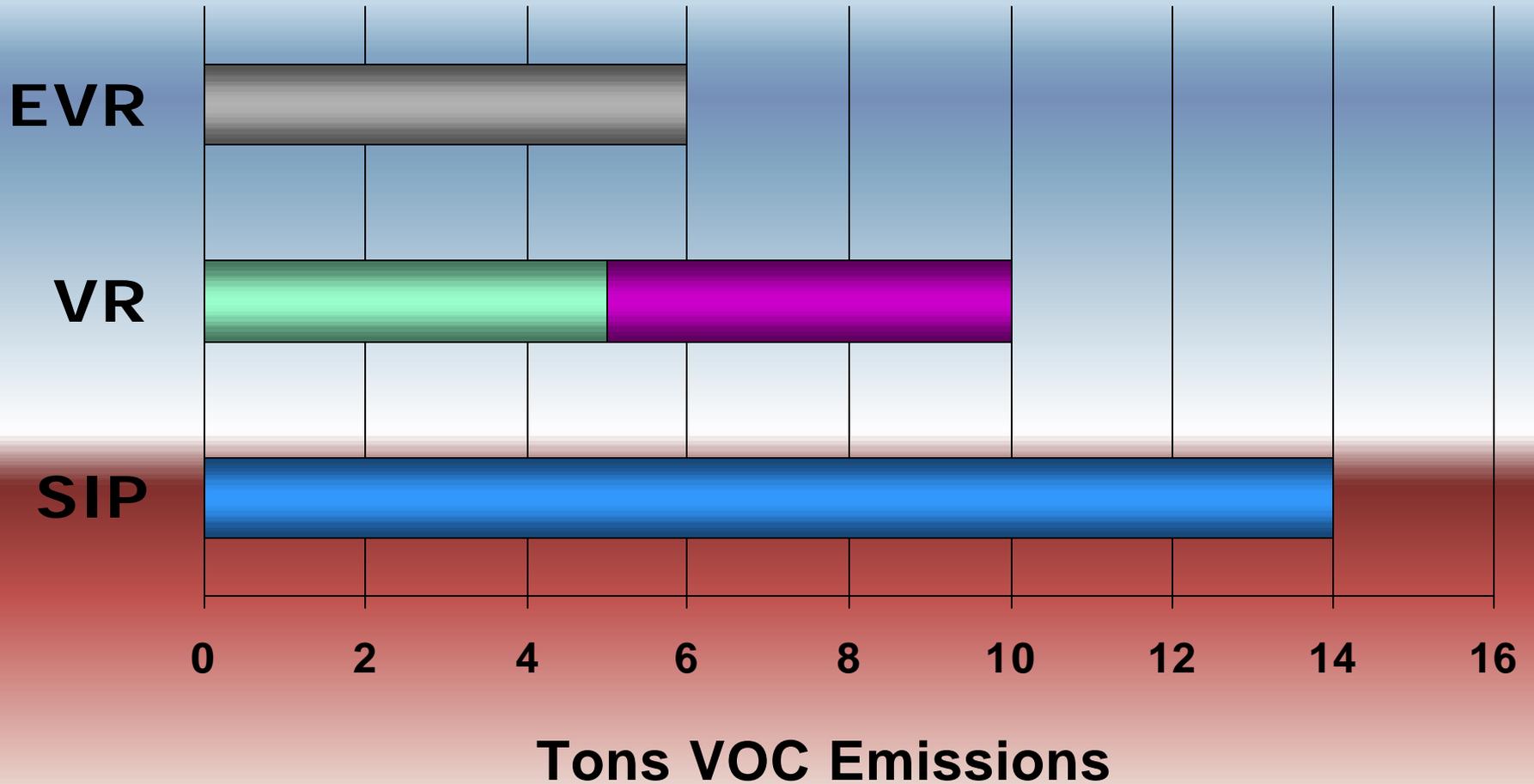
- Review feasibility for:
  - final liquid retention limit
  - dripleless nozzle
  - in-station diagnostics
- Technology Review in 2002  
(prior to affecting existing facilities)

# Environmental and Economic Impacts

---

- SIP Settlement
- EVR Emission Reductions
- Cost-effectiveness

# SIP Lawsuit Agreement



# EVR Emission Reductions

## 2010 ROG Estimates

---

	Emission Category	SCAB tons/day	Statewide tons/day
1	Phase I Vapor Recovery	2.1	5.0
2	Phase II Vapor Recovery	1.3	3.1
3	ORVR Compatibility	2.7	6.3
4	Liquid Retention	0.1	0.2
5	Spillage and Dripless Nozzle	1.6	3.9
6	In-Station Diagnostics	2.8	6.6
	TOTALS	10.6	25.1

# Cost-Effectiveness Comparison

---

<b>Regulation</b>	<b>Cost Effectiveness \$/lb ROG</b>
<b>SCAQMD Architectural Coatings Rule (2002 limits)</b>	\$6.70
<b>Portable Gasoline Containers (9/99)</b>	\$2.01
<b>Proposed Enhanced Vapor Recovery</b>	\$1.80
<b>Consumer Products Mid-term 2 (10 / 99)</b>	\$0.40
<b>Consumer Products Mid-term 1 (7/97)</b>	\$0.25

# Outreach

---

- Air Pollution Control Districts
- State Water Resources Control Board
- Vapor Recovery Equipment Manufacturers
- Petroleum Marketers
- Service Station Operators
- Web Page, Publications, Tradeshow

# EVR Key Issues

---

- Decertification of all systems
- Recertification timing
- In-Station Diagnostics
- Impact on Small Business
- Transfer of Certification

# Decertification of All Systems

---

- New standard triggers decertification
  - Affects existing installations in 4 years
  - Affects other states
- Comment
  - Improving existing systems will get emission benefits sooner
- Response
  - Will delay some EVR effective dates if other parts of EVR are implemented earlier than originally proposed

# Recertification of all systems

---

- Comment
  - Effective date of April 2001 does not provide time to recertify systems:
    - new application data requirements
    - extension from 90 to 180 days minimum
    - extension from 100 to 200 car test
- Response
  - Provided more time to certify Phase II

# In-Station Diagnostics

---

## Comment:

- Great concept - but should focus on improving systems, not monitoring
- ISD delay suggested

## Response:

- Monitoring leads to improvements in durability and reliability, and
- Increased emission control
- Later effective dates allow ISD development

# EVR Amended Schedule

<i>Effective Date</i>	<i>Module</i>	<i>Emission Category</i>	<i>Proposed Operative Date</i>
<i>April 2001</i>	1	Phase I	April 2001
	3	ORVR Compatibility	April 2003
	4	Liquid Retention	
		➤ 350 ml	April 2001
	➤ 100 ml	April 2003	
5	Spillage	April 2004	
	Dripless Nozzle	April 2004	
<i>April 2003</i>	2	Phase II	April 2003
<i>April 2003</i>	6	In-Station Diagnostics	
<i>April 2004</i>		➤ 1,800,000 gal/yr	April 2003
		➤ 160,000 gal/yr	April 2004

Stations < 160,000 gal/yr exempt from ISD

# Effect of Proposal Changes on Small Business

---

- Delay implementation up to 3 years
- Exempt low throughput stations
- Technology review

# Transfer of Certification

---

- Manufacturer responsible for system
- Transfer of certification to new company can lead loss of accountability
- Original proposal
  - certification expire upon date of transfer
- Amended proposal
  - certification expire normally, new company would need to recertify

# Future Activities

---

- Continue existing system improvements
- Certify equipment to new standards
- Establish expanded CAPCOA certification review process
- Technology Review 2002
- Refine emissions inventory
- Contractor training/licensing

# Conclusion

---

- Proposal developed with extensive outreach
- Adjustments made to address concerns
- Proposed amendments cost-effective
- Essential to fulfill SIP agreement commitment