California Environmental Protection Agency

Air Resources Board

Workshop For 2013 Vapor Recovery Rulemaking

Enhanced Vapor Recovery (EVR)

and

Gasoline Cargo Tanks

April 23, 2012 - Sacramento

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Presentation Outline

1. Purpose / Context of Today's Workshop
2. 2013 EVR Regulatory Proposal
   - Enhanced Conventional (ECO) Nozzles for On-Board Refueling Vapor Recovery (ORVR) Fleet Fueling Facilities
   - Aboveground Storage Tank (AST) Certification Test Procedures
   - Cargo Tank Certification
3. Questions, Contact Information

Purpose of Workshop

- Inform interested parties about proposed changes to vapor recovery program
- Solicit feedback on proposed changes
- Our Goal: Identify and resolve any issues before we present these amendments to our Board for adoption
- Board Hearing scheduled for July 2013

Public Participation

Public Workshops
Oct/Nov 2012, April 2013

Rulemaking 45-day Comment Period
June 10 – July 25, 2013

Board Hearing
July 25, 2013

Informal Process

Present concepts and draft regulatory language

Solicit and consider stakeholder feedbacks on concepts and draft language

Formal Process

Staff publishes the proposed regulatory change and provides reasons including costs and impact

Public may submit written or oral comments on staff's proposal to Board

Final Stage

Staff formally presents proposal to Board

After considering all comments, Board accepts proposal, directs staff to address any remaining issues, or rejects proposal

Vapor Recovery Program

- Vapor recovery program has been in place for over 35 years in California
- Staff is focused on improving the vapor recovery program by:
  1. Reducing operation and maintenance costs
  2. Implementing technical improvements
  3. Reducing emissions where practical and cost-effective

Oct / Nov 2012 Workshops

- Short-term, mid-term, and long-term concepts for program improvement were presented.
- Some of the short-term measures are already being implemented:
  - ARB staff audit of manufacturer training
  - Mix & match of balance EVR components
  - Informational Bulletin issued regarding removal of In-Station Diagnostics (ISD) on stations under 600,000 gal. annual throughput
  - Online vapor recovery equipment complaint form

The Next Steps…

- Mid-term items are in today's proposal
- Long-term items in late 2014 will include:
  - ISD overpressure alarm solution
    - Staff is revising proposal based on new data
    - Advisory 405-B remains in place
  - ISD software enhancements that will improve diagnostic capability and streamline or reduce compliance testing
  - Field test procedure improvements

2013 VAPOR RECOVERY REGULATORY PROPOSAL

2013 Regulatory Proposal

- Enhanced Vapor Recovery (EVR) Proposal
  - Adopt new standards for ECO Nozzles to be used at ORVR Fleet Fueling Facilities
  - Revise TP 201.1, Volumetric Efficiency of Phase I EVR
  - Revise TP 206.2, Emission Factor of Standing Loss Control Systems with Processors for ASTs
- Cargo Tank Proposal
  - Revise Cargo Tank Certification and Test Procedures

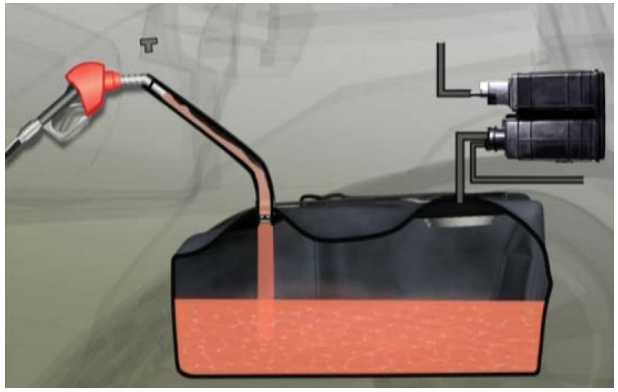
Enhanced Conventional Nozzles (ECO Nozzles)

For Use at On-Board Refueling Vapor Recovery (ORVR) Fleet Fueling Facilities

ORVR / Phase II Background

Two Control Systems Targeting the Same Emission Source: vapor displaced during vehicle fueling

1. Phase II Vapor Recovery: gasoline dispensing facility (GDF) based, vapor returned to storage tank, uses coaxial nozzles and hoses, vapor return piping
2. Onboard Refueling Vapor Recovery (ORVR): vehicle based, vapor is captured in a carbon canister on the vehicle and later burned, no vapor for Phase II system to recover, federal requirement for vehicles after 1998

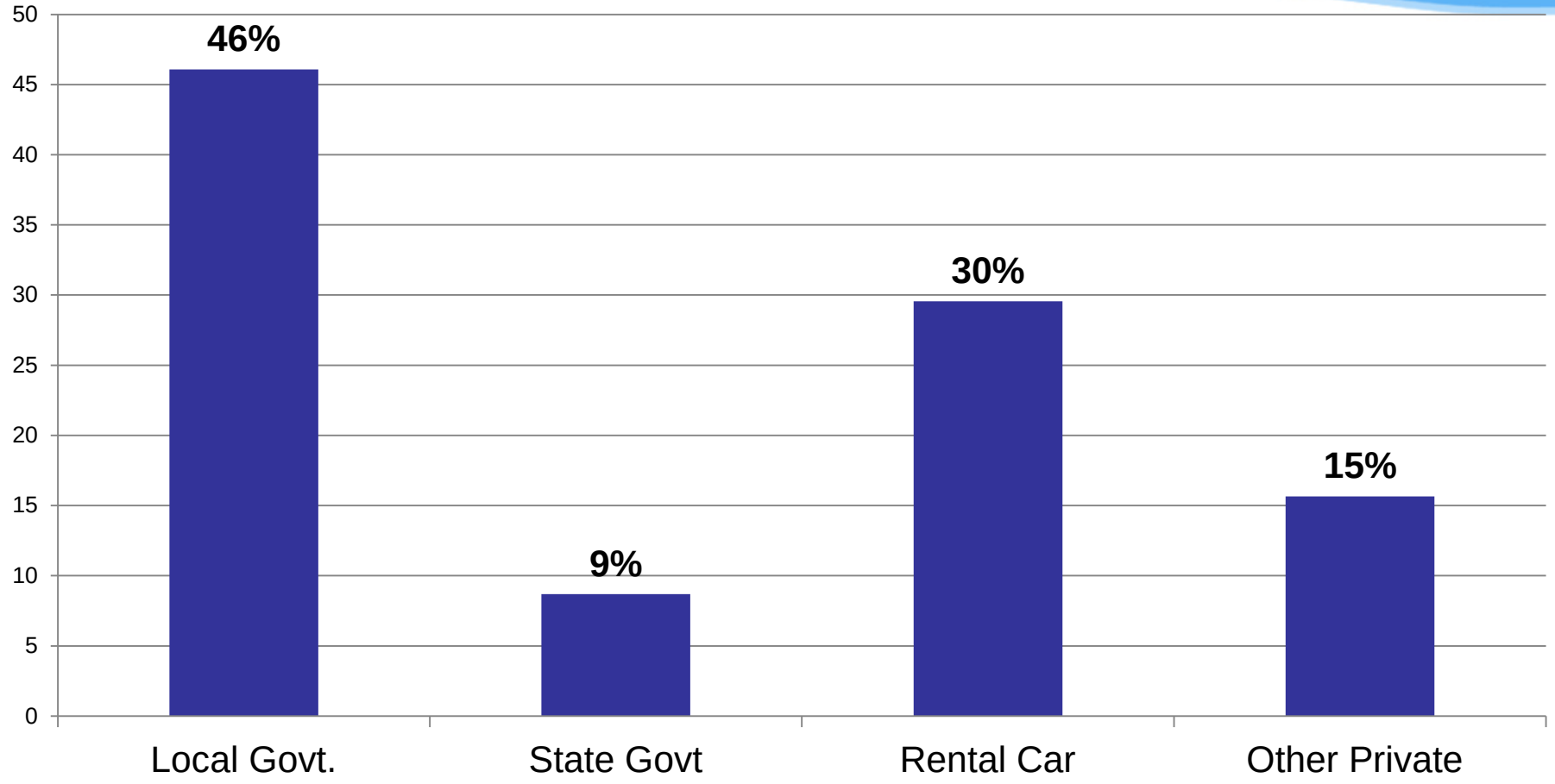


ORVR Fleet Facilities

- Many Air Districts allow ORVR fleet GDFs to operate without Phase II Vapor Recovery
  - 2/20/2008 Letter from ARB to Air Districts
  - Consistent with U.S. EPA Memo
- Requires a fleet of 90% to 100% ORVR vehicles, depending on the district rule
- Applicable to non-retail facilities only
  - Car rental, government, or corporate fleets

ORVR Fleet Facility Ownership

Ownership Percentage
Based on data Provided by South Coast AQMD



ECO Nozzles

- Since these facilities are exempt from Phase II Enhanced Vapor Recovery (EVR), what standards apply?
  - Conventional nozzle (no vapor return path)
  - Phase II EVR nozzle with vapor path capped
- New standards would provide statewide consistency, emission reductions, and cost savings

ECO Nozzle Standards

Performance Type	Requirement	Test Procedure
Nozzle Spillage	≤ 0.24 pounds/1,000 gallons	TP-201.2C
Post-Refueling Drips	≤ 3 Drops per Refueling	TP-201.2D
Liquid Retention	≤ 100 mL per 1,000 gallons	TP-201.2E
Nozzle Spitting	≤ 1.0 mL / nozzle / fueling	TP-201.2E

ECO Nozzle

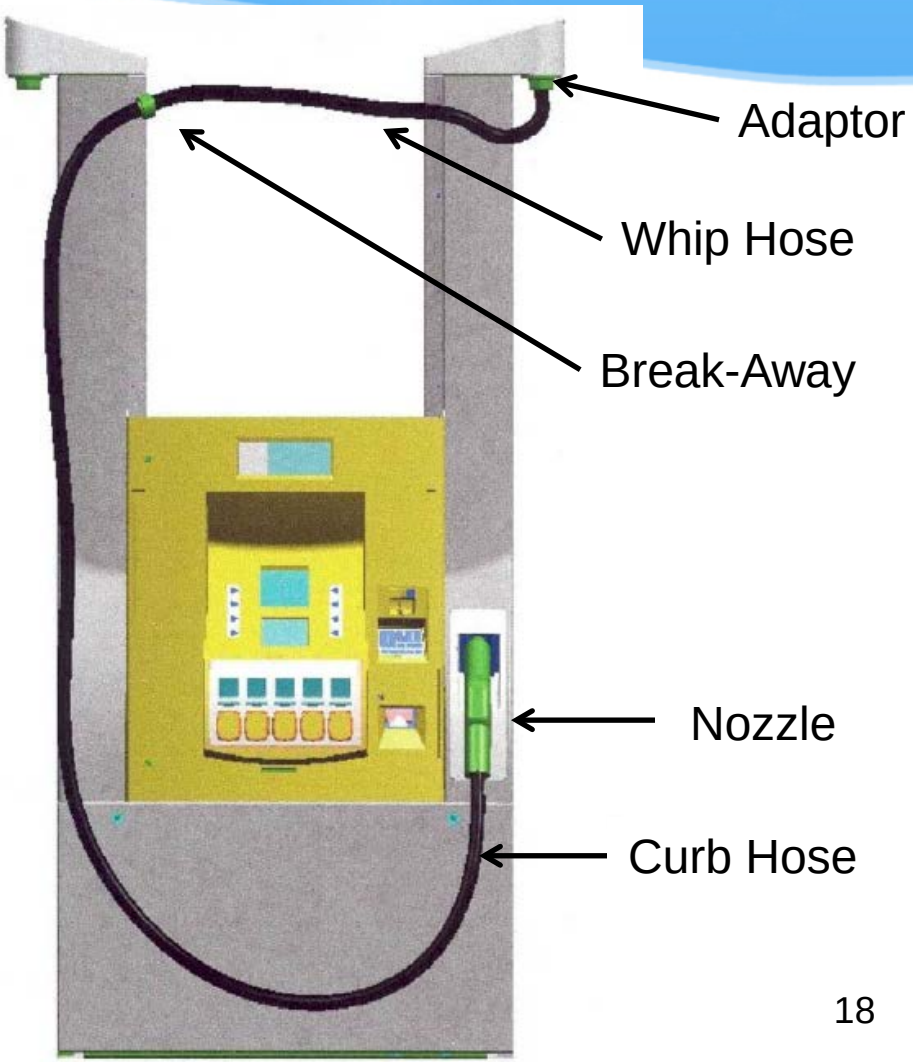
- Incorporates relevant Phase II EVR standards and specifications
- Insertion interlock is required to meet spitting standard
- New nozzle will cost more than current conventional nozzle but less than EVR nozzle

Current ORVR Fleet Fueling Data

- 322 Facilities Statewide
  - 145 using EVR nozzles and hardware
  - 177 using uncertified conventional nozzles and hardware
- Average of 3 nozzles per facility
  - 435 EVR, 531 Conventional, 966 Total
- Average facility throughput of 19,500 gallons per month

Upgrading to ECO Nozzles

- "Effective Date" would be the day the first ECO Nozzle is certified by ARB
- State Law allows existing equipment to remain in use for four years from the effective date.



ECO Nozzle Costs

Cost of Conversion: Phase II EVR to ECO Nozzle

Component	Phase II EVR Cost	ECO Nozzle Cost	Difference
Adaptor	N/A	$ 21	$ 21
Whip Hose	$ 71	$ 30	$ -41
Breakaway	$ 117	$ 65	$ -52
Curb Hose	$ 172	$ 84	$ -88
Swivel	N/A	$ 29	$ 29
Nozzle	$ 439	$ 305	$ -134
Total	**$ 799**	**$ 534**	**$ -265**

Cost of Conversion: Uncertified Conventional to ECO Nozzle

Component	Uncertified Conventional Cost	ECO Nozzle Cost	Difference
Nozzle	$ 62	$ 305	$ 243
Total	**$ 62**	**$ 305**	**$ 243**

Emission Reductions from ECO Nozzle Proposal

- Spillage reduced from 0.61 to 0.24 pounds/1000 gallons dispensed
  - Applies only to the conventional nozzles that will be upgraded to ECO Nozzles
- Spillage reduced by ~15,400 pounds per year
  - Approximately 2,500 gallons (or $9,500) of fuel

Total Statewide Cost of ECO Nozzle Proposal

- Cost of Upgrading Conventional to ECO Nozzles = $32,000 / year
- Savings from Replacing EVR with ECO Nozzles = $29,000 / year
- Value of Fuel Saved from Reduced Spillage = $9,500 / year
- Total: $32,000 - $29,000 - $9,500 =

Statewide Savings of ~$6,500 / year

Cost Effectiveness of ECO Nozzle Proposal

- Considering only the facilities upgrading from conventional to ECO Nozzles:

  $1.48 per pound reduction

- Statewide total, taking into account the savings from facilities replacing EVR equipment with ECO Nozzle equipment:

  $-0.39 per pound reduction

REVISE AST CERTIFICATION TEST PROCEDURES

TP-201.1: PHASE I VOLUMETRIC EFFICIENCY

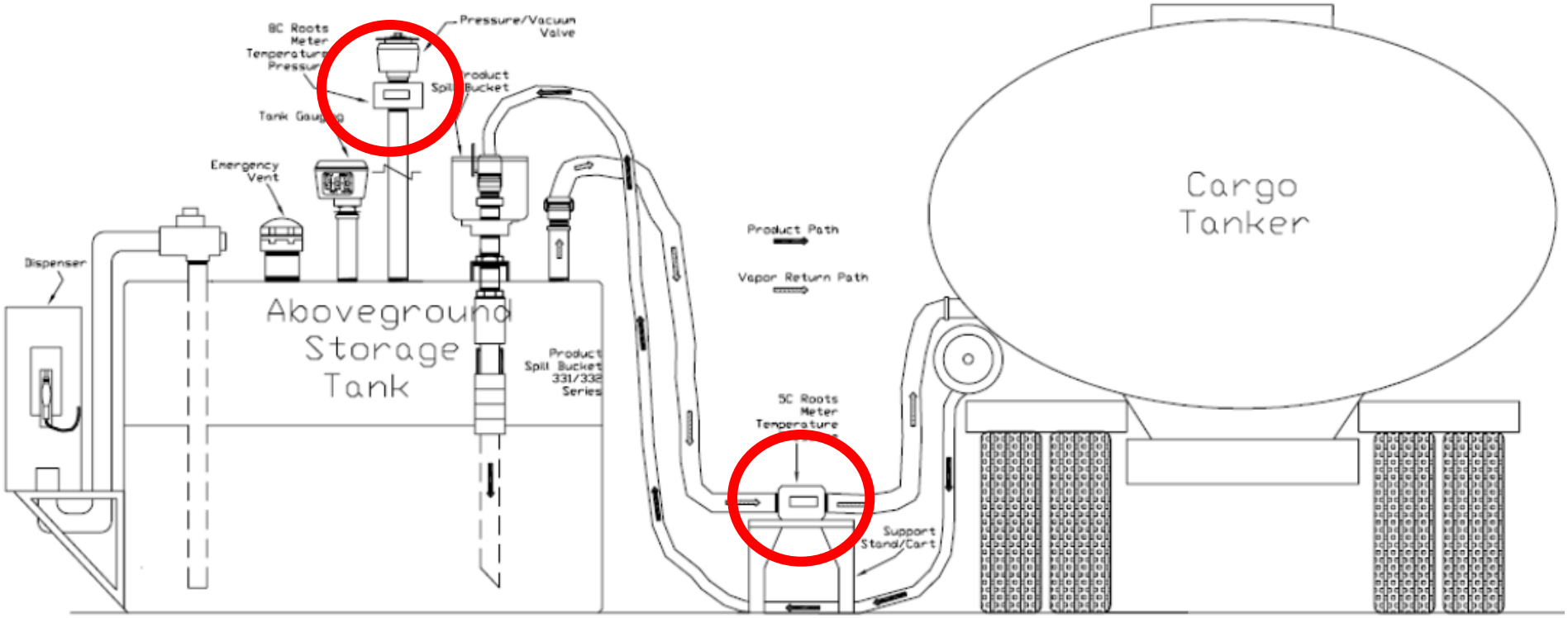
TP-206.2: STANDING LOSS CONTROL (SLC) EMISSION FACTOR

TP-201.1 Amendments

- Phase I EVR systems must achieve a volumetric (fuel transfer) efficiency of ≥ 98%
- Existing Phase I Volumetric Efficiency Test Procedure TP-201.1 was originally developed for UST applications in 1996
- When ARB adopted EVR for AST in 2008, TP-201.1 was incorporated for AST certification
- TP-201.1 not well suited for AST's due to pressure driven vent line emissions which may occur during idle periods

TP-201.1 Amendments
Background

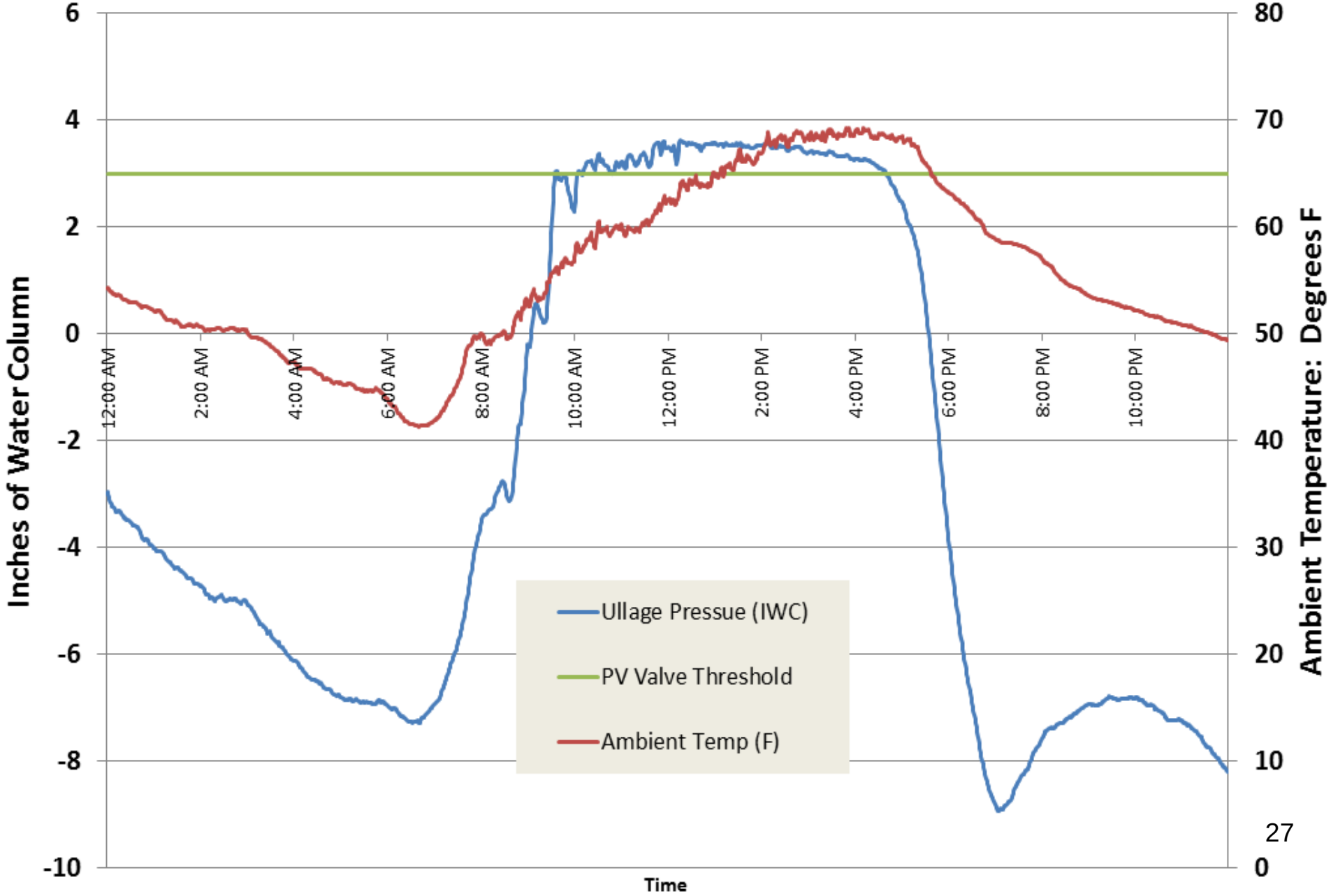
Phase I Efficiency Equation: $E = (100)\,[(V_{returned} - V_{vent}) / (V_{returned})]$



TP-201.1 Amendments
Description of Problem

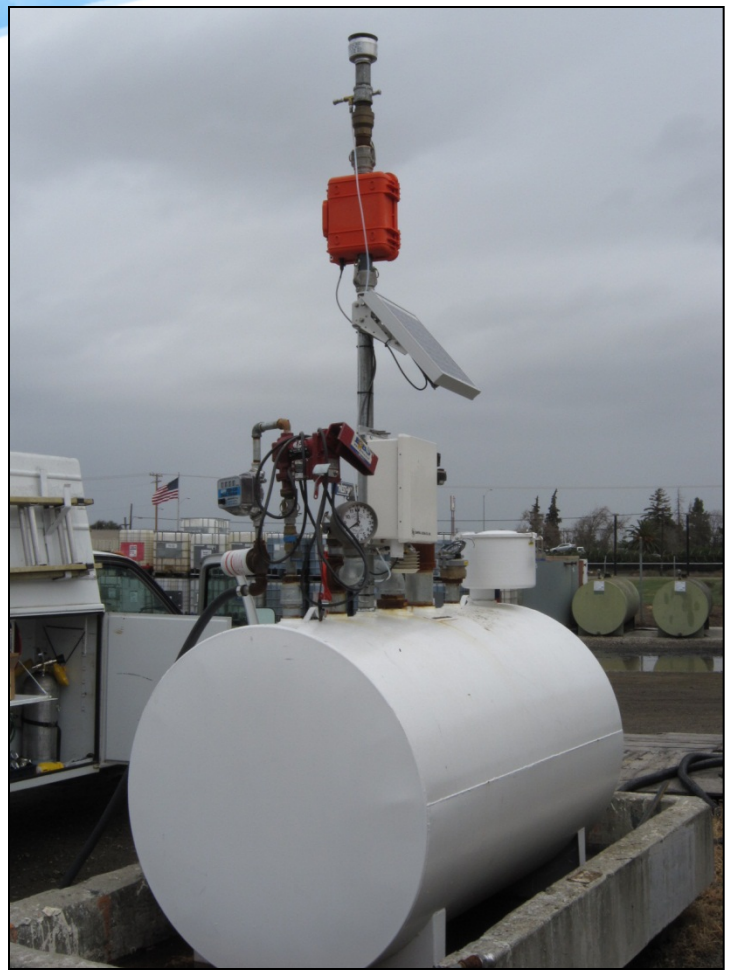
- Pressure driven vent line emissions commonly occur in single wall AST due to ambient temp increase & fuel evaporation
  - ARB data shows an average vent line flow rate of ~1 cfh
- Vent line flow rate not due to design of Phase I system, yet included in efficiency equation

Pressure & Temperature Profile
Single Wall AST Test Site - March 10, 2012



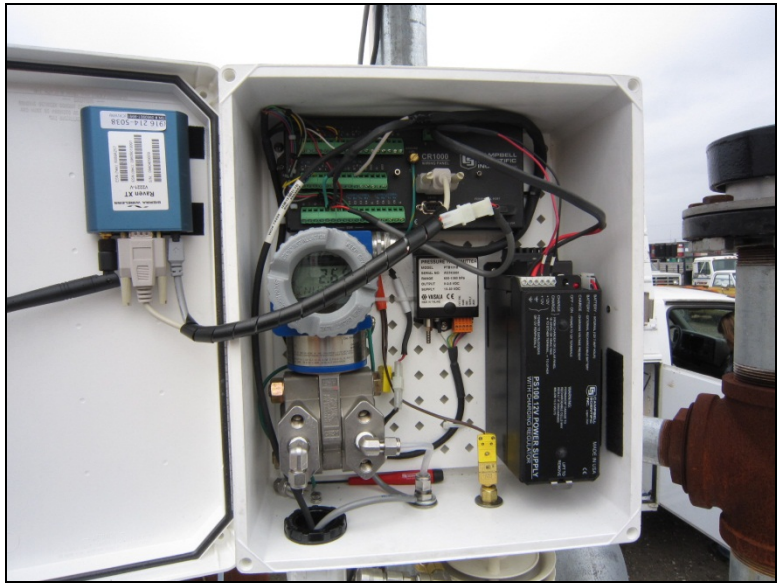
TP-201.1 Amendments

Method Development Test Site



Parameters Measured:

- Vent Line Flow Rate (cubic feet)
- Ullage Pressure (Inches WC)
- Ambient Temperature (°F)
- Atmospheric Pressure (Inches Hg)
- Via Cell Phone Modem



TP-201.1 Proposed Changes

- For ASTs, remove the post fuel delivery waiting period on vent line emissions
- For ASTs, only measure vent volume emissions during the delivery
- Figures and language updated for ASTs

TP-206.2 Amendments
Background

- TP-206.2 is used by ARB staff during certification testing to measure the emission factor of AST Standing Loss Control (SLC) systems that use a vapor processor
  - Measures mass emitted during periods of no deliveries or dispensing (diurnal emissions)
  - Result is reported as mass emitted per 1000 gallons of tank ullage space
  - Based on TP-201.2, emission factor test for Phase II EVR systems on underground tanks

TP-206.2 Amendments

- TP-201.2 was amended in 2012 to:
  - Accommodate modern sampling equipment
  - Allow staff some flexibility when configuring test equipment in the field
  - Provide instructions for sampling of processor inlet and outlet streams when appropriate
  - Update instrument calibration requirements
- Todays proposal would make similar changes to TP-206.2

TP-206.2 Amendments

- Proposed changes will not alter the performance standard for SLC
- No significant changes in cost or time required for completing testing per TP-206.2
- No SLC system with vapor processor has been submitted to ARB for evaluation
- TP-206.2 is used by ARB staff, so changes should not impact the public

AMENDMENTS TO GASOLINE CARGO TANK VAPOR RECOVERY PROGRAM

Cargo Tank Vapor Recovery Program Amendments

- **CP-204** - *Certification Procedure for Vapor Recovery Systems of Cargo Tanks*
  - ***TP-204.1*** - *Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks*
  - ***TP-204.2*** - *Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks*
  - ***TP-204.3*** - *Determination of Leak(s)*

What's Changing?

1. Administrative changes

2. Streamlining the program regarding new components and/or systems

3. Harmonizing the California and Federal requirements for leak decay testing

New Components

1. Must meet the specifications of G-70-10-A, Exhibit II

2. Must meet annual leak rate criteria per CP-204

California and Federal Requirements

- Different test methods required
  - California = TP-204.1
  - Federal = EPA Method 27

- Different Test Timelines

Acceptable Test Methods

Currently Required	Proposed
TP-204.1	TP-204.1, or EPA Method 27 with exceptions

EPA Method 27 with 3 exceptions

1. Must meet all “degassing” or vapor purging restrictions of CP-204
2. Must meet Leak Rate Criteria in CP-204
3. Pressure, Vacuum, and Internal Vapor Valve Tests passed consecutively

Test Timelines

California vs. Federal Test Windows

Program	Current	Proposed
California	60 days prior to expiration	30 days prior to expiration
Federal	30 days prior to expiration	30 days prior to expiration

TP-204.3
Vapor or Liquid leaks

Sniffer test and liquid leak standards during loading operations

- Maintains EPA Method 21 as equivalent with the exception of a probe distance of 2.5cm (approximately 1 inch)

Benefits of Amendments

- Eliminates the certification process for new components
- Harmonizes ARB and Federal Dept. of Transportation (DOT) testing requirements

QUESTIONS AND COMMENTS

Contact Information

	Staff	Contact Info
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http://www.arb.ca.gov/vapor/rulemaking.htm