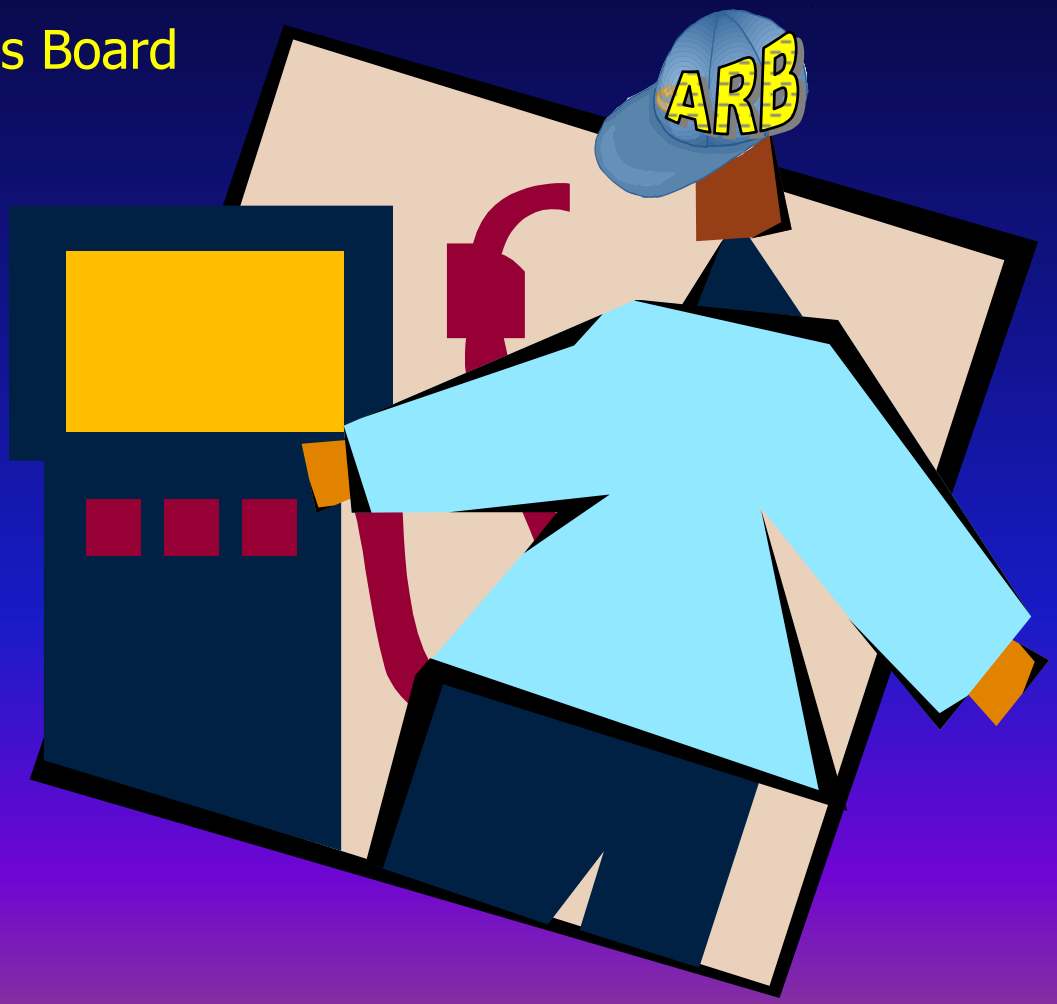
Enhanced Vapor Recovery Technology Review

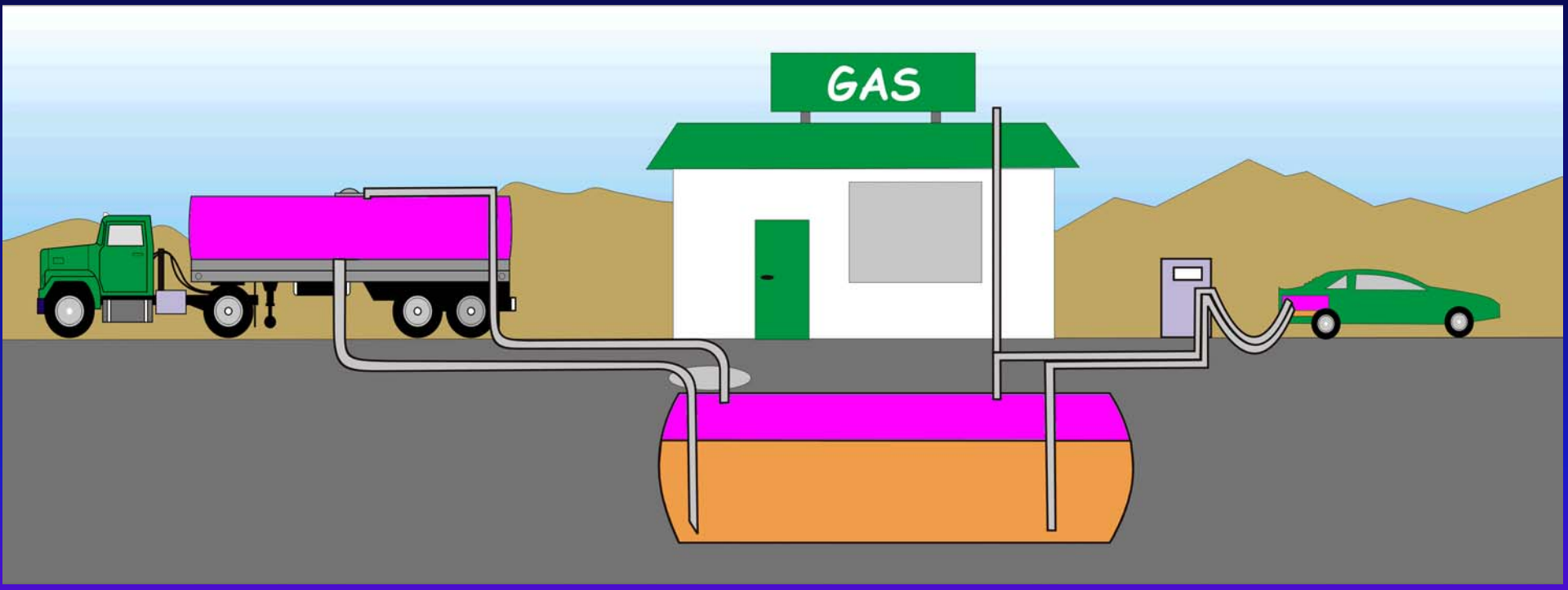
California Air Resources Board
December 12, 2002



Outline

- Vapor Recovery Background
- EVR Program Modules
  - EVR Technology Review
  - Proposed Regulatory Amendments
- EVR Program Implementation
  - Proposed Regulatory Amendments
- EVR Cost-Effectiveness

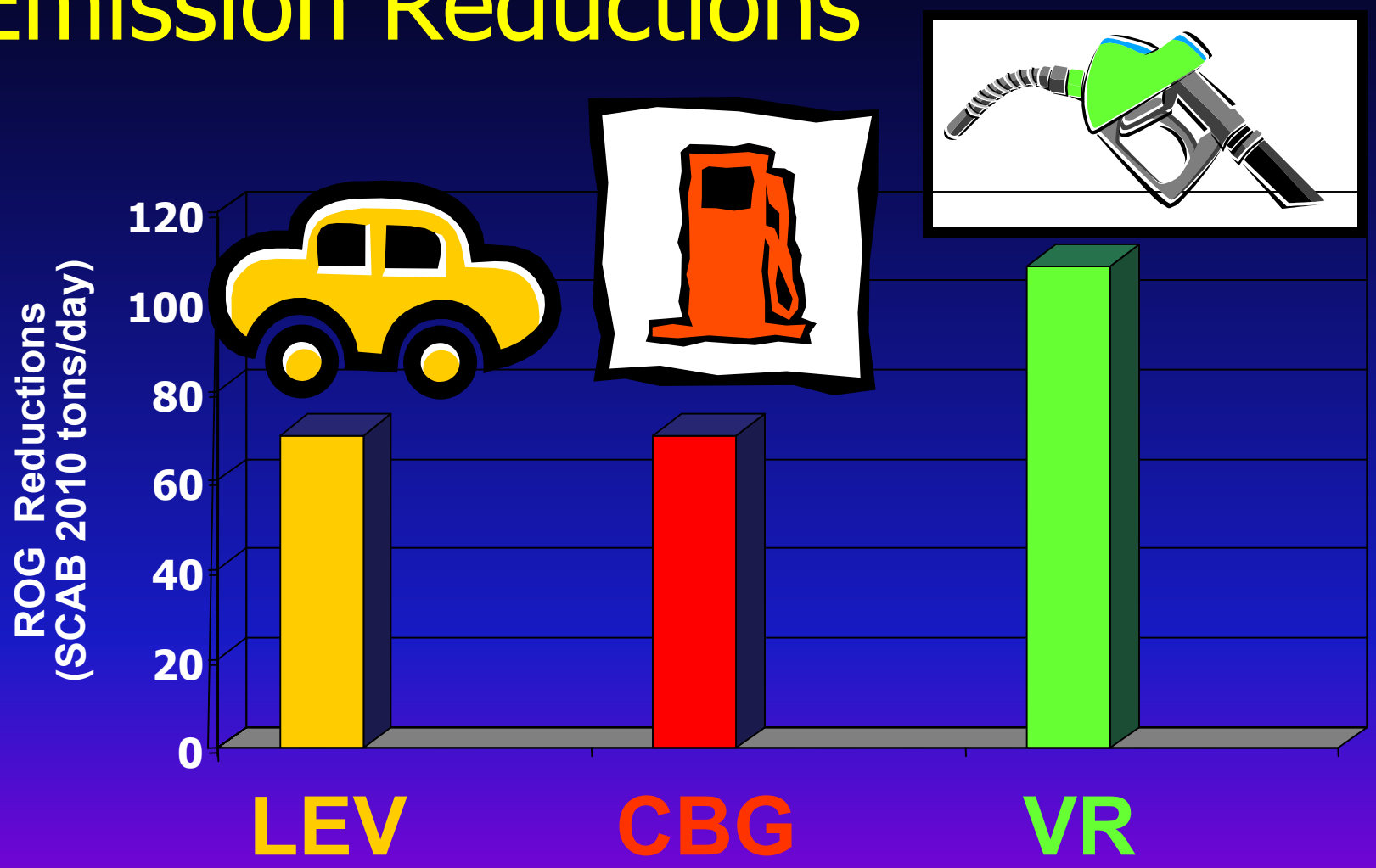
Vapor Recovery at Service Stations



Phase I

Phase II

Vapor Recovery Provides Large Emission Reductions



EVR Program

- Regulations approved March 2000
- Technology-forcing standards
- Technology review for EVR standards with future effective dates
- EVR amendments proposed as result of tech review and EVR implementation

EVR Modules

PHASE I SYSTEM

Module 1: Phase I vapor recovery

PHASE II SYSTEM

Module 2: Phase II standards & specs

Module 3: ORVR compatibility

Module 4: Liquid retention and nozzle spitting

Module 5: Spillage and dripless nozzles

Module 6: In-station diagnostics

Module 1
Phase I Vapor Recovery

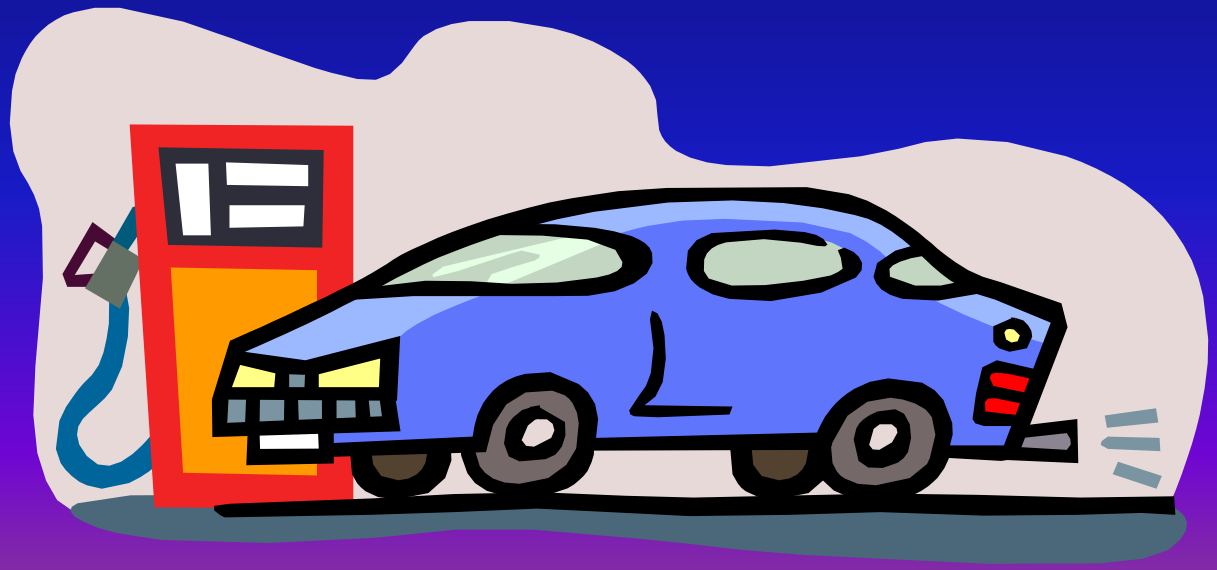
- Not part of technology review
- Two EVR Phase I systems certified
- No Phase I standards changed
- Modifications proposed for five Phase I test procedures (TPs)
  - clarify methods to ensure compliance tests are comparable to certification

Criteria for Technological Feasibility Phase II - Modules 2-6

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

Module 2
Phase II Standards & Specifications

- 18 standards & specifications
  - All feasible or likely to be feasible
  - No changes proposed

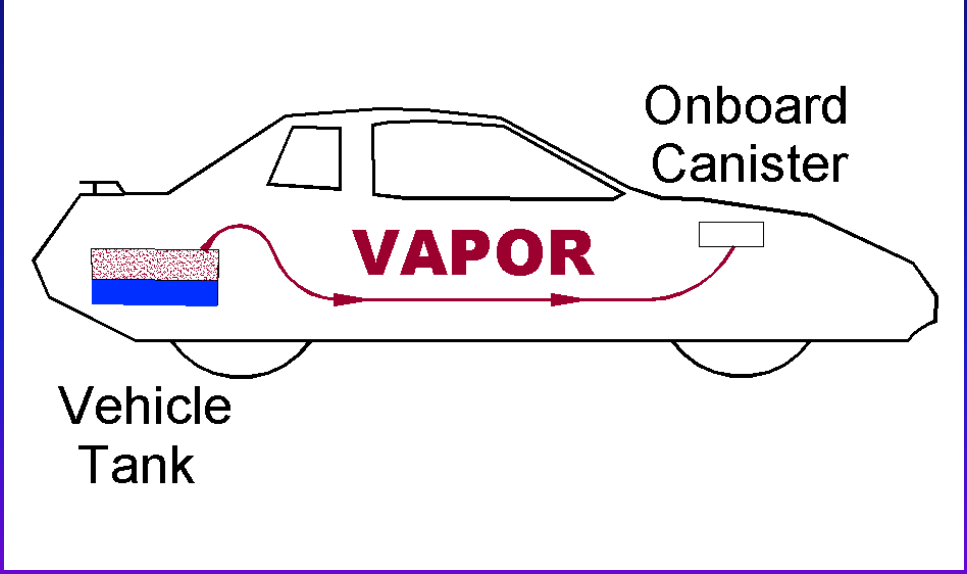


Module 2
Phase II Test Procedures

- Three new test procedures proposed
  - TP-201.2G, TP-201.2J, TP-201.7
- Modifications to three existing test procedures proposed
  - TP-201.2F, TP-201.2, TP-201.2B

Module 3
ORVR Compatibility

- ORVR compatible systems available since 1998
  - Feasibility demonstrated
- No change proposed

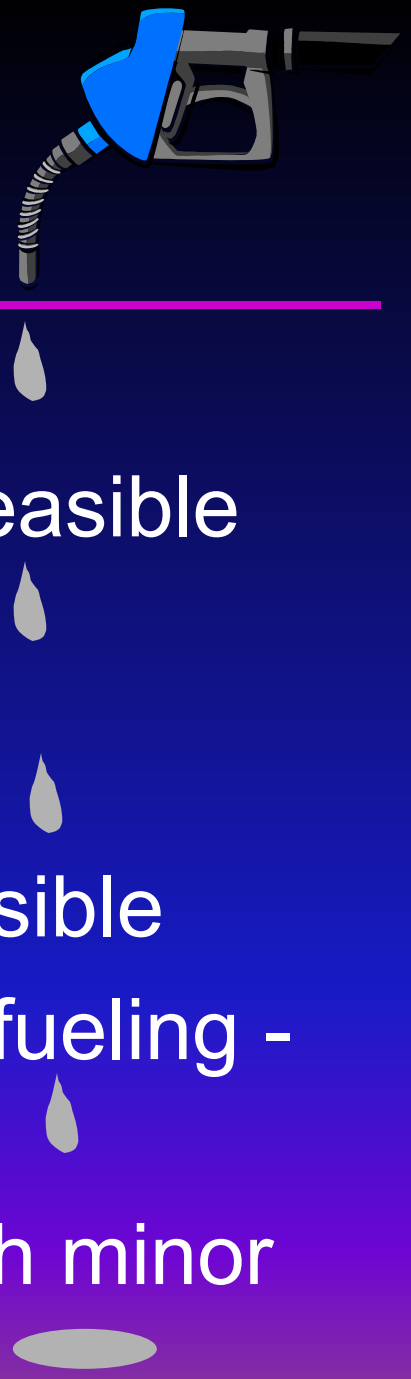


ORVR = Onboard Refueling Vapor Recovery

Module 4
Liquid Retention and Nozzle Spitting

- Liquid Retention
  - prevents gasoline evaporation between fuelings
  - 82% of existing nozzles meet 100 ml standard
  - feasible - no changes proposed
- Nozzle Spitting
  - reduce accidental release of gasoline
  - met by existing balance nozzles
  - recent data shows feasible for EVR assist nozzles
  - feasible - no changes proposed

Module 5
Spillage and "Dripless Nozzle"

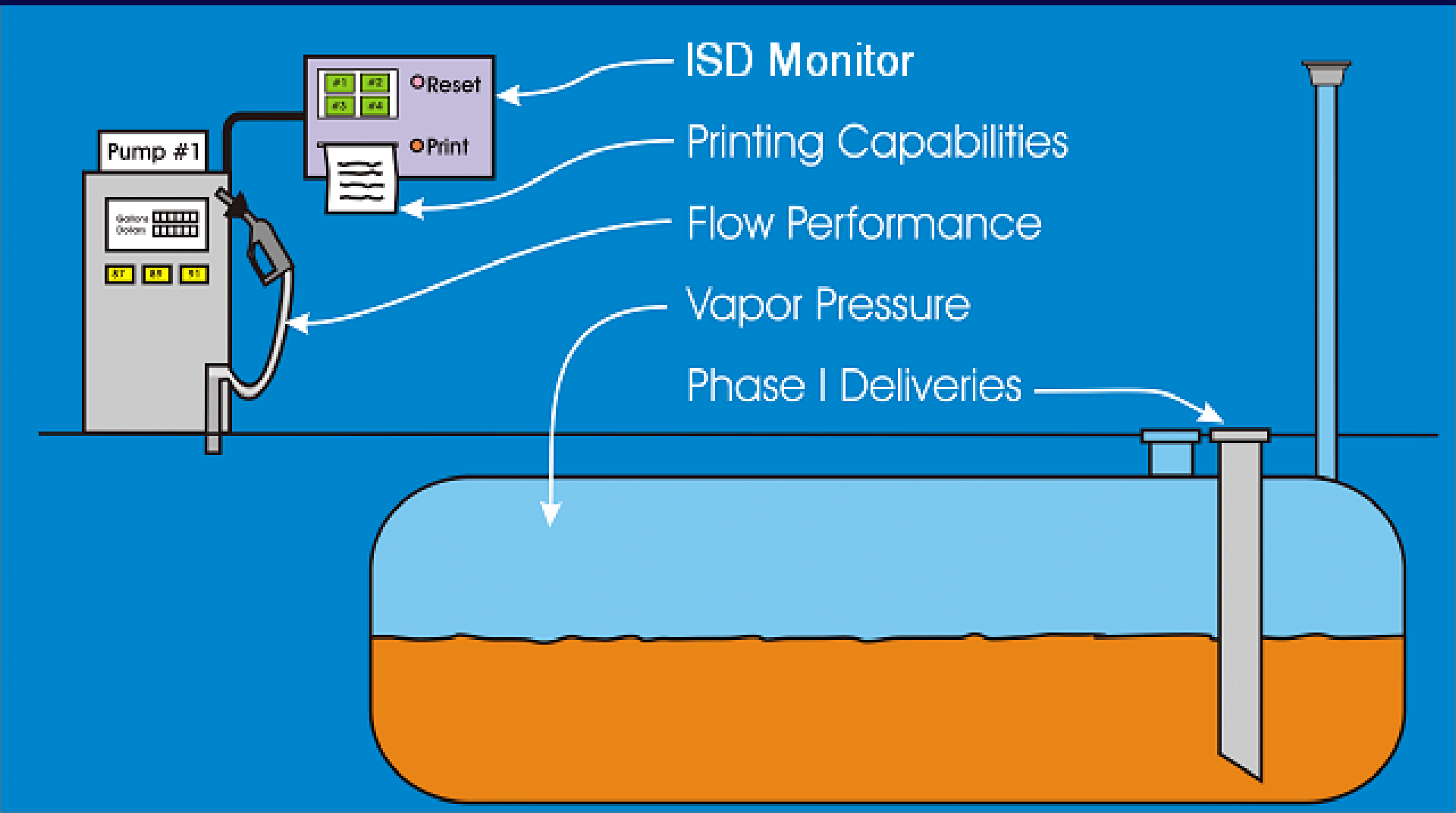


- Spillage
  - 0.24 lbs/1000 gals standard feasible
  - no change proposed
- Dripless nozzle
  - one drop standard not yet feasible
  - propose change to 3 drops/refueling - feasible
  - keep adopted test method with minor changes

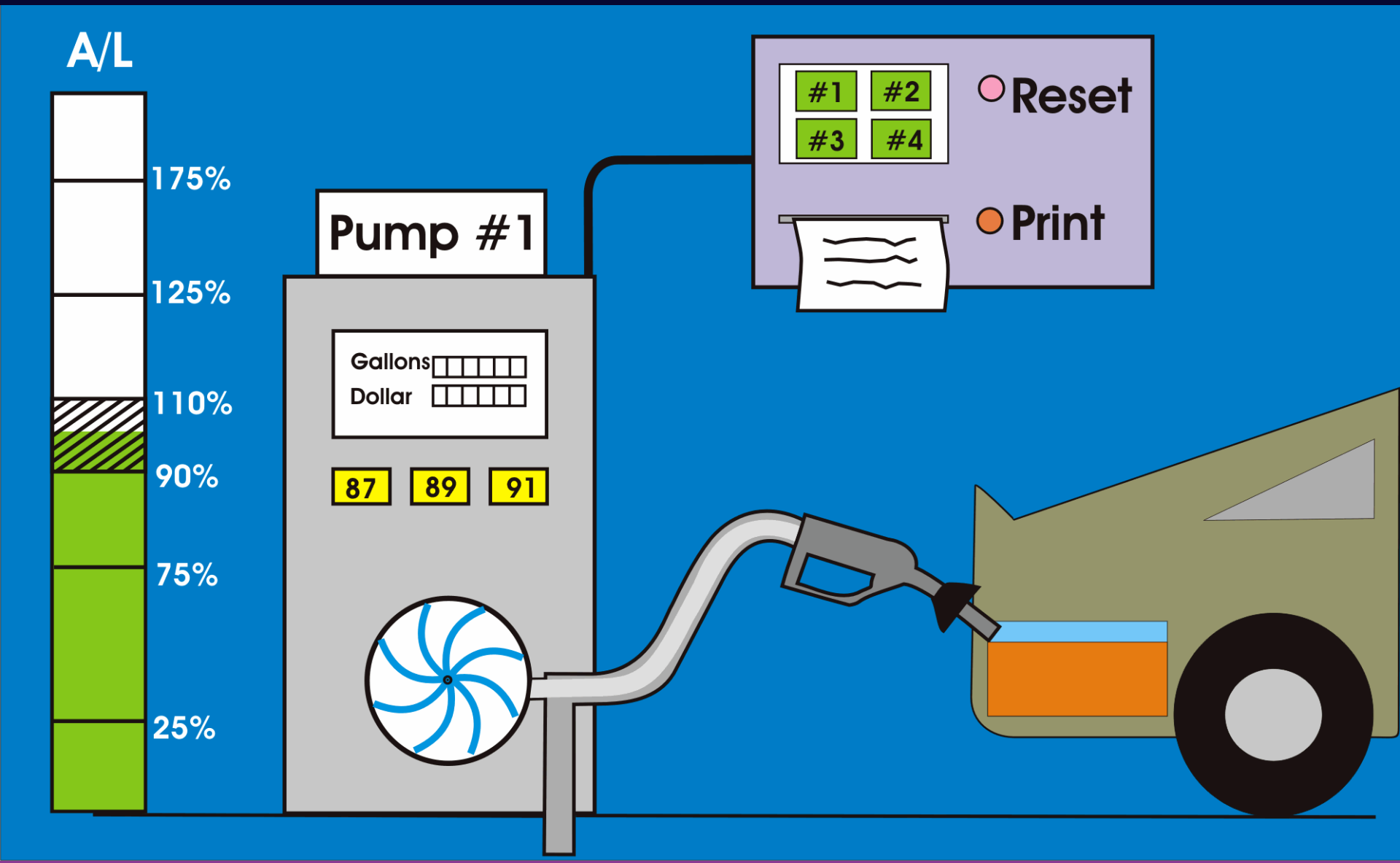
Module 6
In-Station Diagnostics

- Identify failures automatically
- Notifies station operator
- Reduces emissions by early detection and prompt repair
- Supplements district inspections
- Concept similar to OBD for vehicles
- Tie-in to existing UST leak monitors

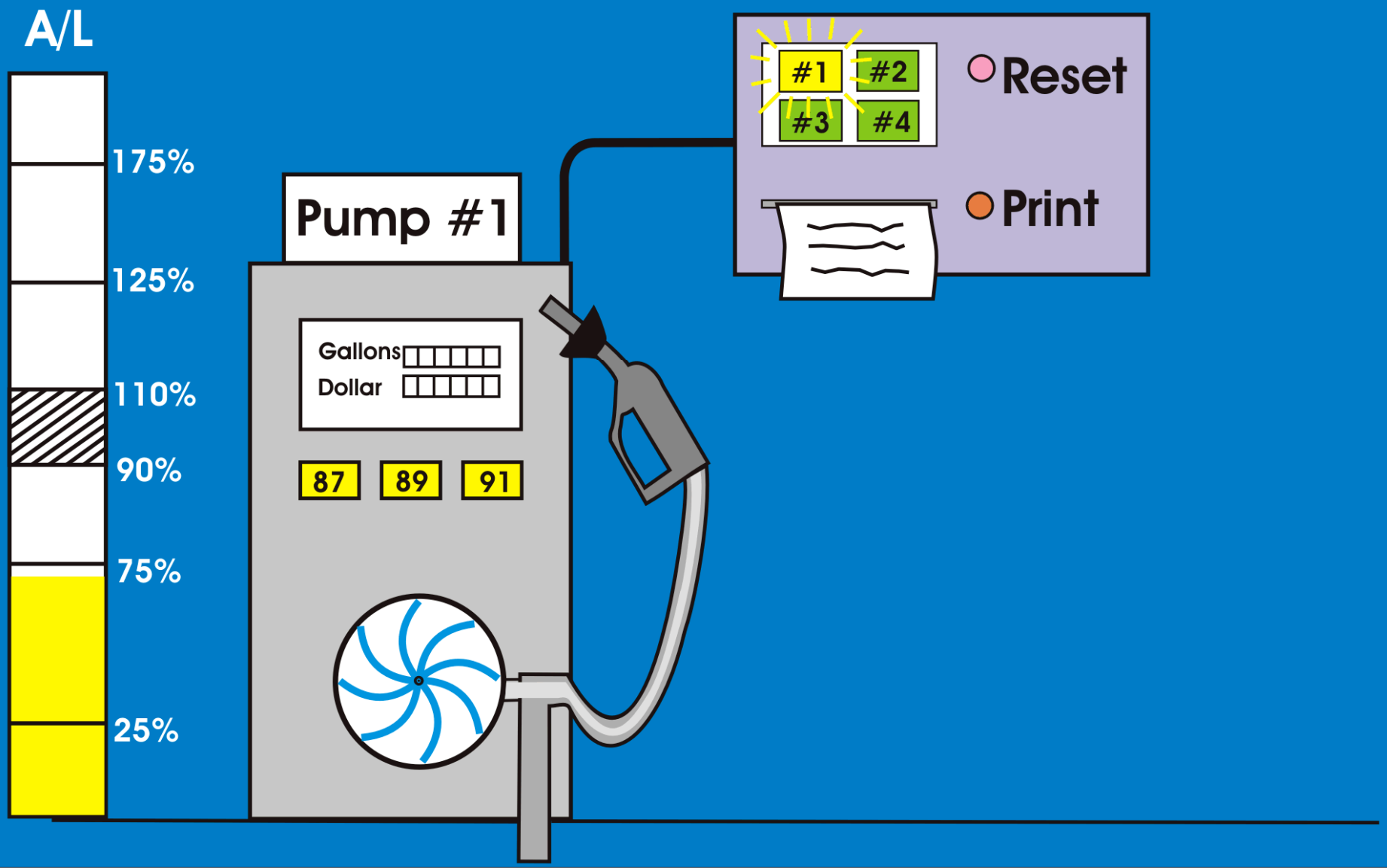
ISD System


Reset
Print
Pump #1
ISD Monitor
Printing Capabilities
Flow Performance
Vapor Pressure
Phase I Deliveries

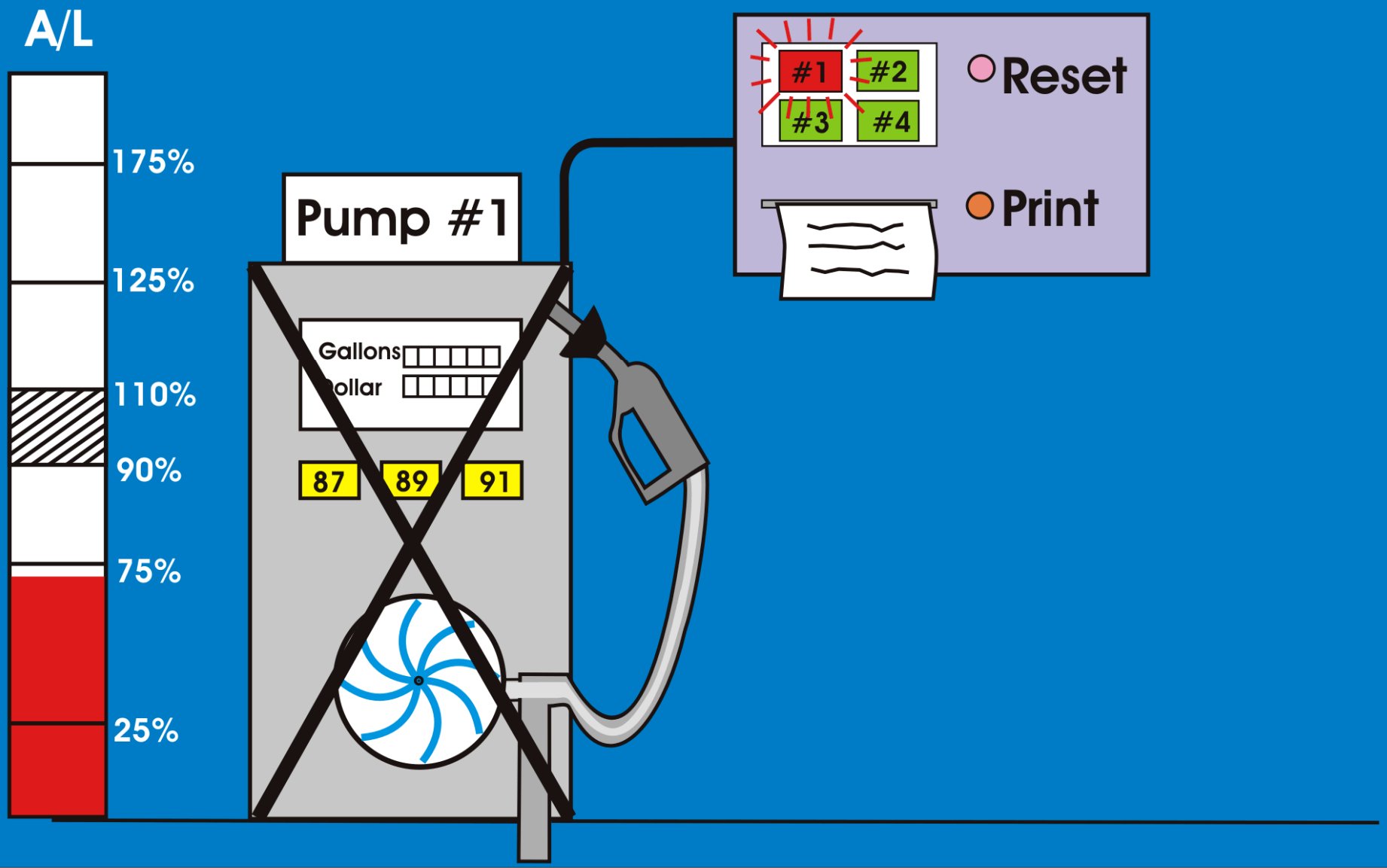
ISD Normal Operation



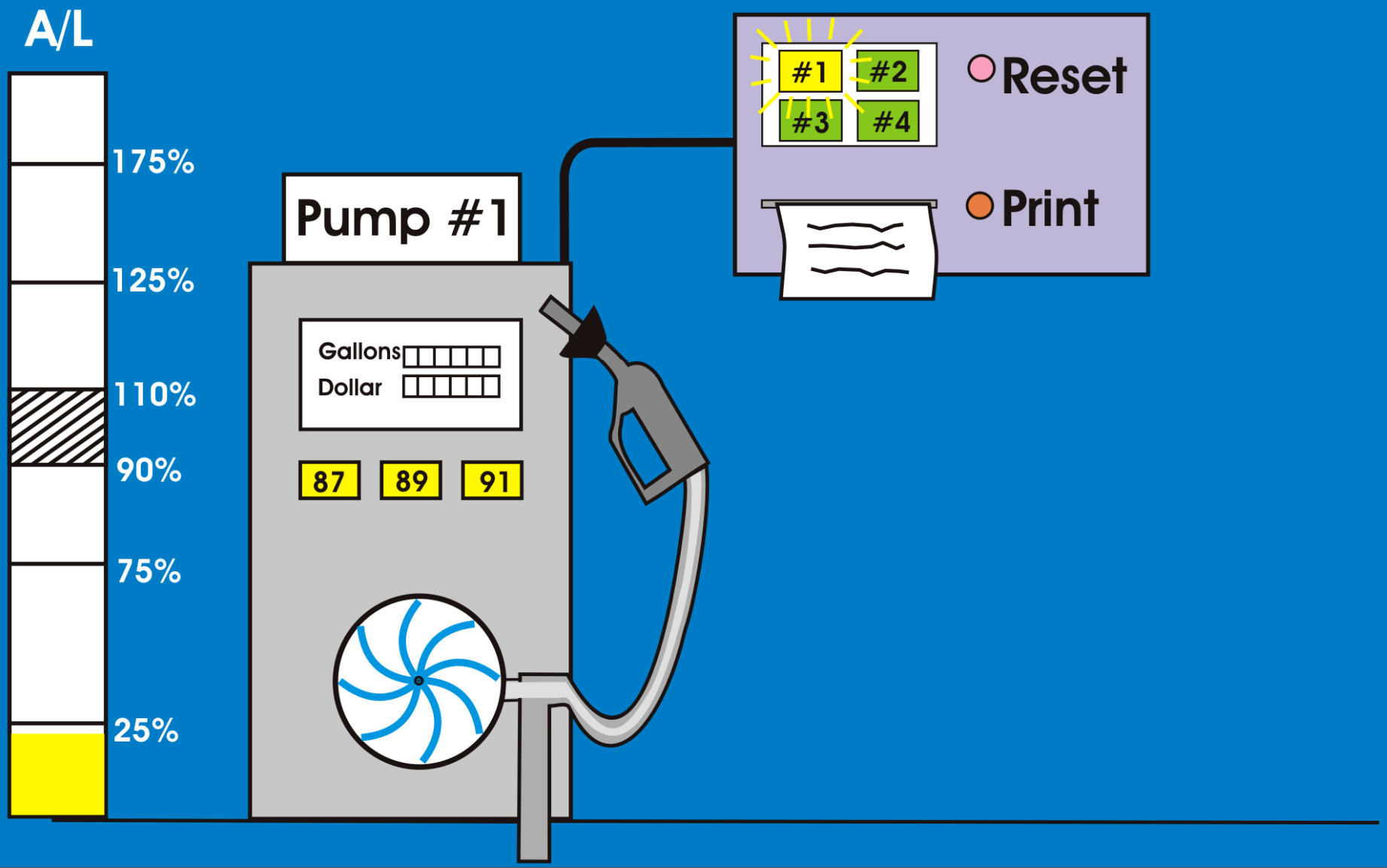
Degradation Warning after Week One



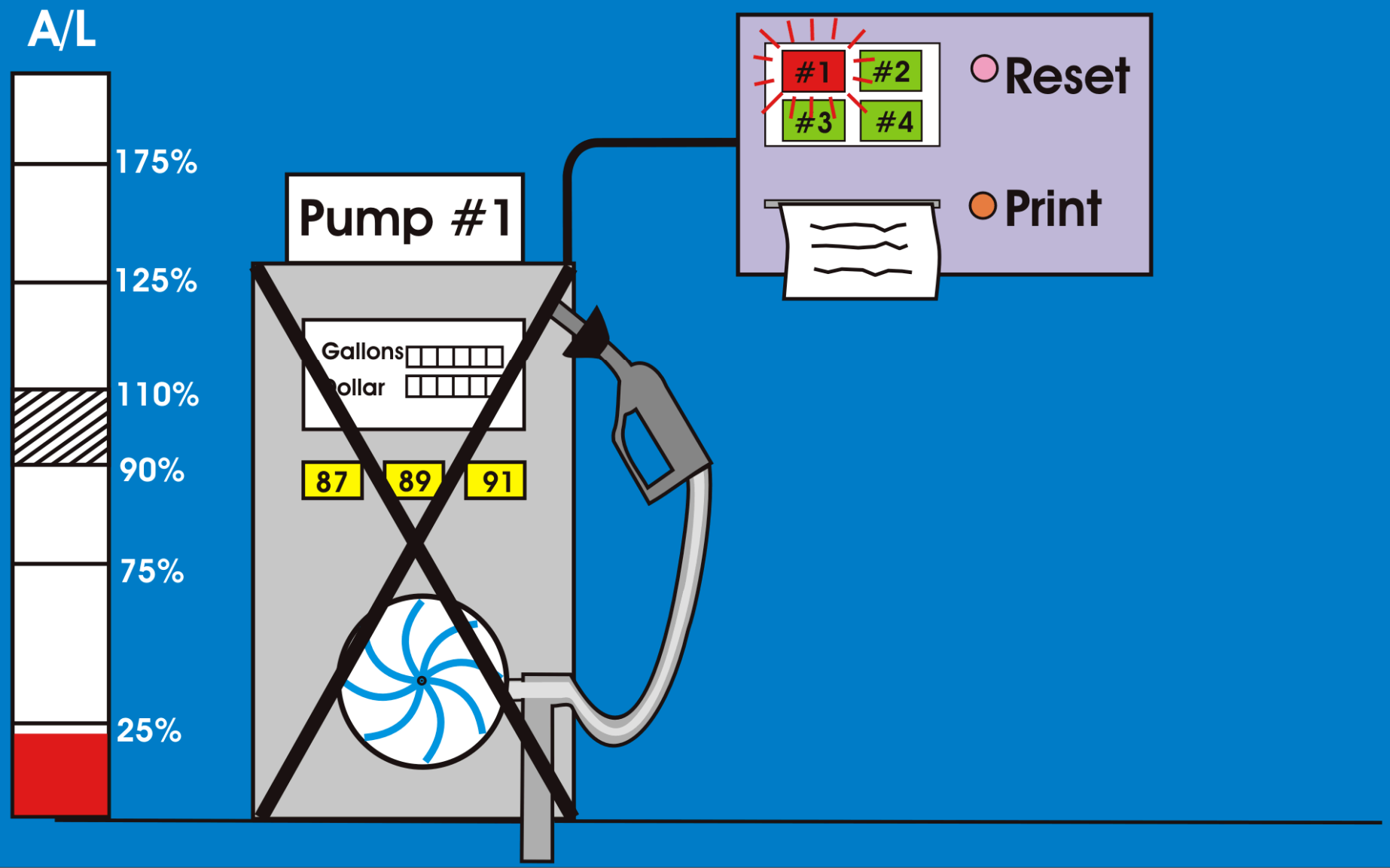
Degradation Failure After Week Two



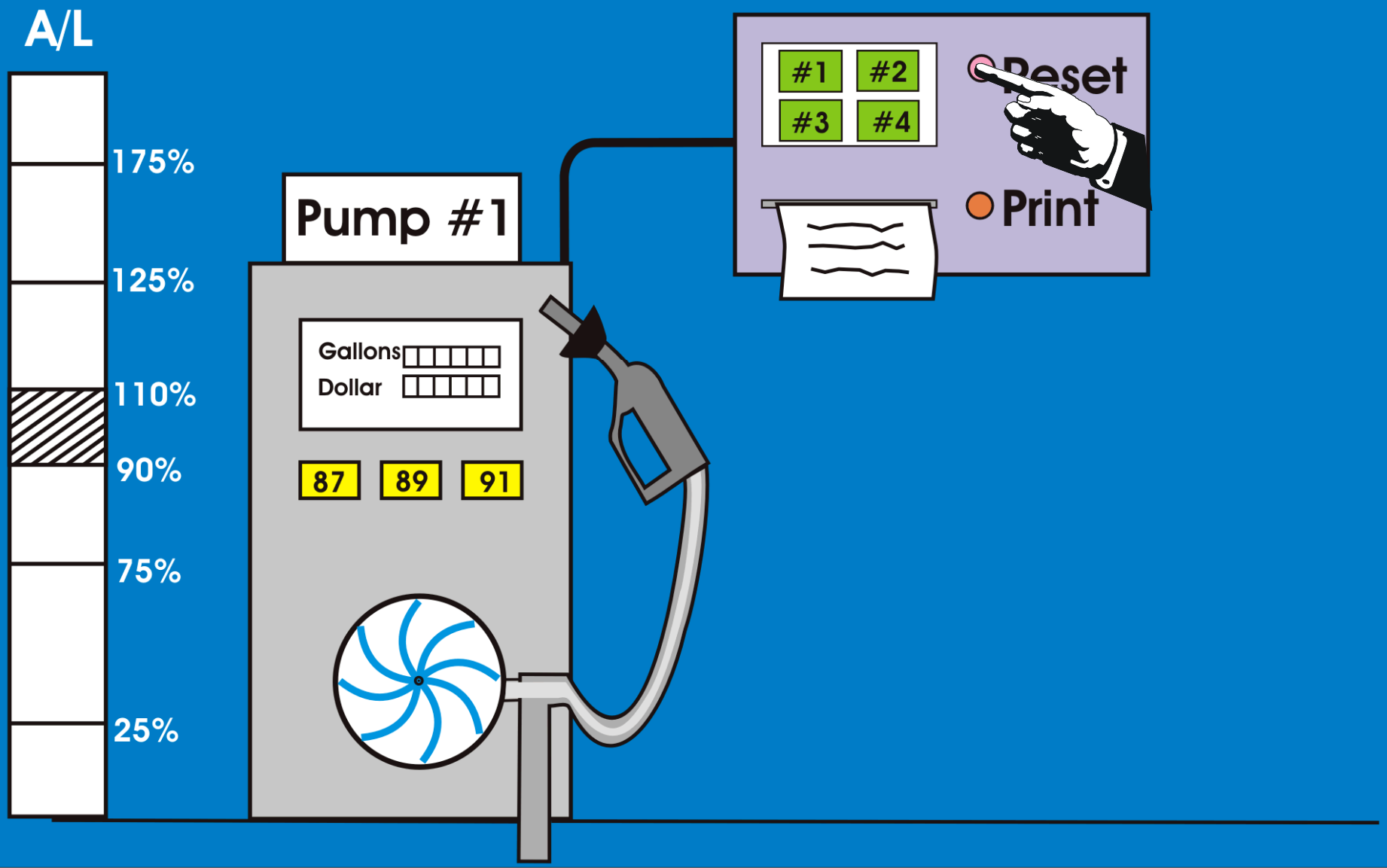
Gross Warning after Day One



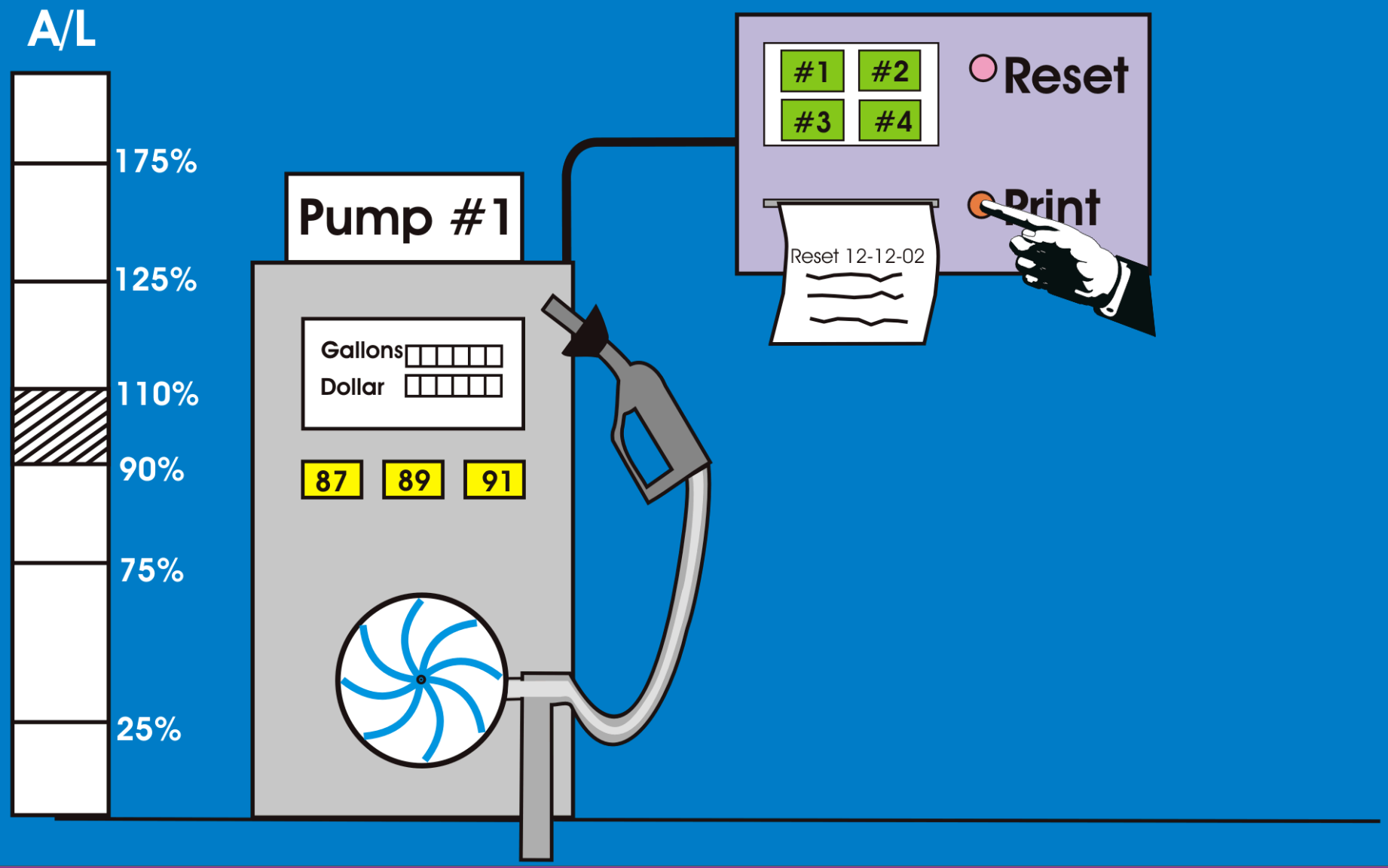
Gross Failure After Day Two



Reset Button Activates Dispenser



Printout Available on Site



Sample Report

ISD Daily Report for December 12, 2002

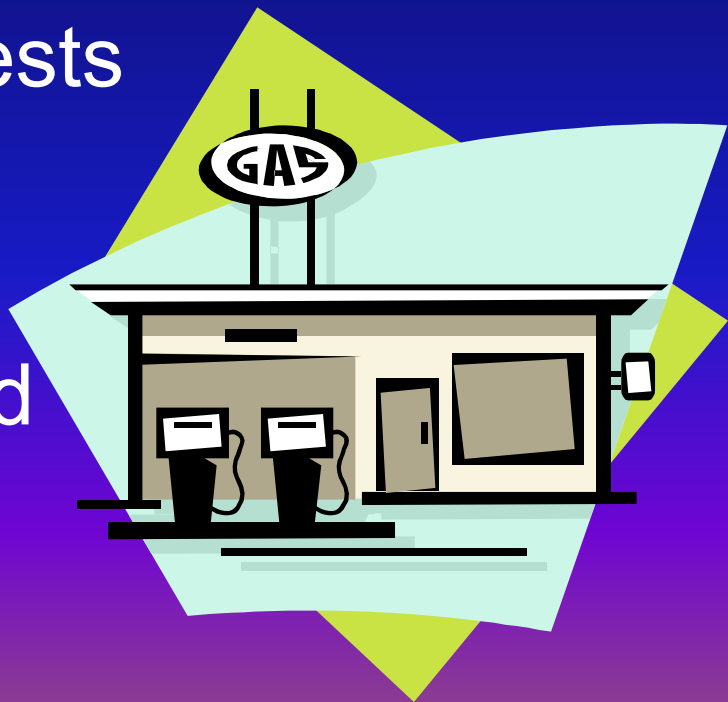
Dispenser #1	Fail	A/L = .20
Dispenser #2	Pass	A/L = .96
Dispenser #3	Pass	A/L = 1.05
Dispenser #4	Pass	A/L = .82

Vapor Recovery System	Fail
Fuel Delivery	None
Pressure Integrity Status	Pass

Reset Button Pressed 12-12-02 10:05 a.m.

Module 6
ISD System Pilot Program

- ISD Workgroup formed
- Successful hands-off operation of five ISD stations for two months
- Passed challenge mode tests
  - 99% detection
  - no false failures
- ISD systems demonstrated feasible



Proposed Changes to Improve EVR System Certification

- Clarify cert application requirements
- Clarify cause for cert. test termination
- Allow limited ISD-detected maintenance
- Allow testing on six-pack or unihose
- Allow abbreviated testing for certified components for use on another system

Other Proposed Certification Changes

- Clarify innovative system provisions
- Remove spill container requirements
- Change max HC processor specification
- Clarify ISD reporting requirements

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- **EVR Program Implementation**
  - **Proposed Regulatory Amendments**
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EVR Implementation Issues

- EVR needed for all districts?
- ISD exemption level too low
- Different schedules for EVR standards
- Availability of EVR certified systems

Partial EVR Exemption for Districts in Attainment with State and Federal Ozone Standards

- Exempt existing sites from all EVR modules except ORVR compatibility
- ORVR compatibility to minimize benzene exposure
- New and modified stations must comply
- Six northern CA districts qualify

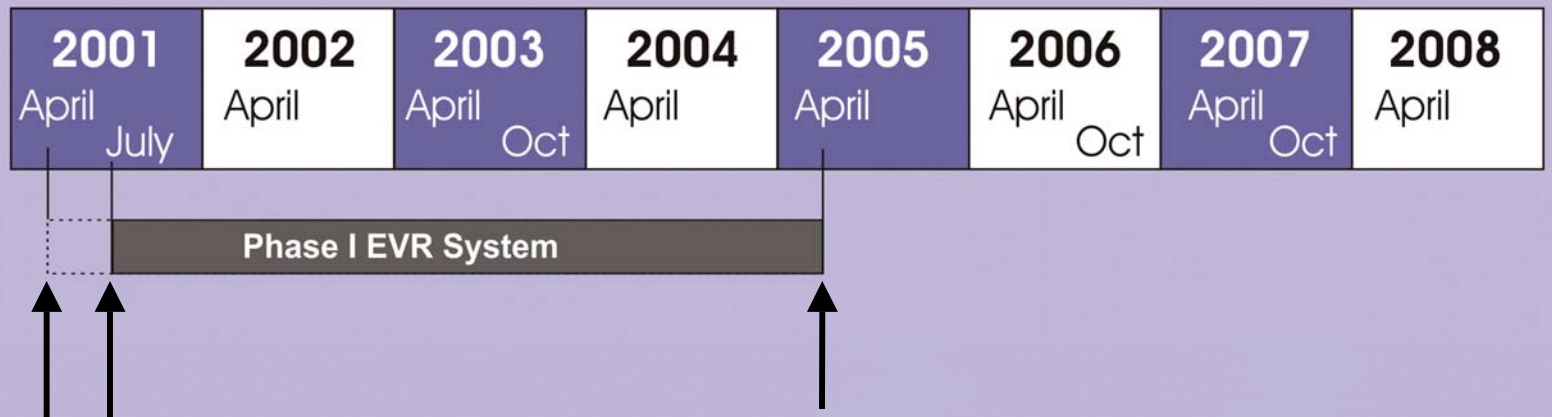
Gasoline Stations (GDF) Rank by Volume Fuel Dispensed

Group	GDF 1	GDF 2	GDF 3	GDF 4	GDF 5
Annual Throughput (gal/yr)	Up to 300,000	300,000 to 600,000	600,000 to 1.2 mil	1.2 mil to 2.4 mil	2.4 mil and up
% throughput	0.6	5.3	34.3	47.1	12.7
% stations	4.7	14.1	45.7	31.3	4.2

Proposed Modification to ISD Exemption

	Exemption Throughput (gals/year)	GDF Category	Lost Emission Reductions (tpd)	% ISD Emission Reductions
Current Reg	160,000	Part of GDF1	0.02	0.24%
Staff Report	300,000	All of GDF1	0.04	0.47%
15-day Change	600,000	GDF1 & GDF2	0.49	5.8%

EVR Implementation Dates

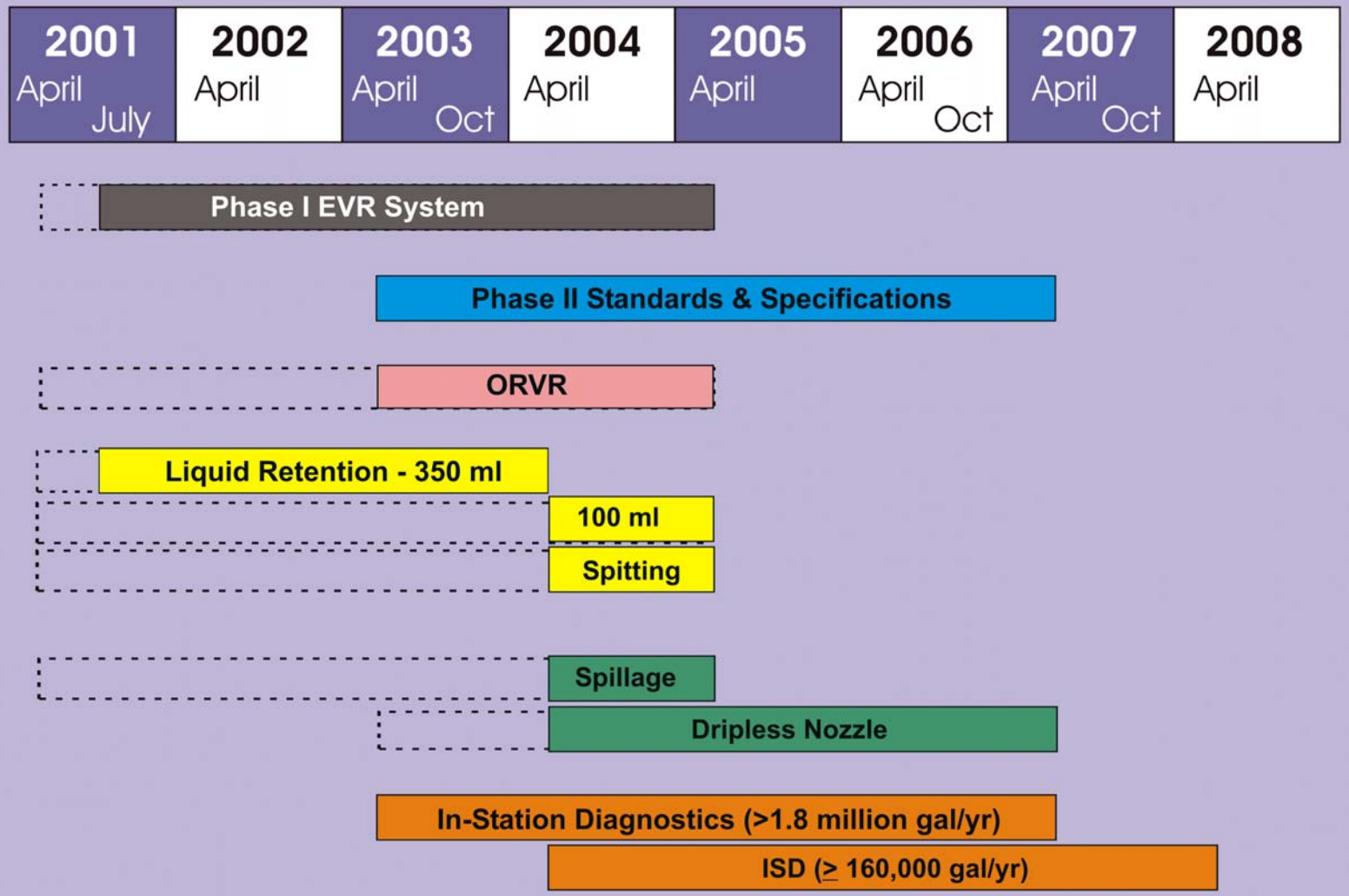


<u>Compliance Date</u> - Date all facilities must comply

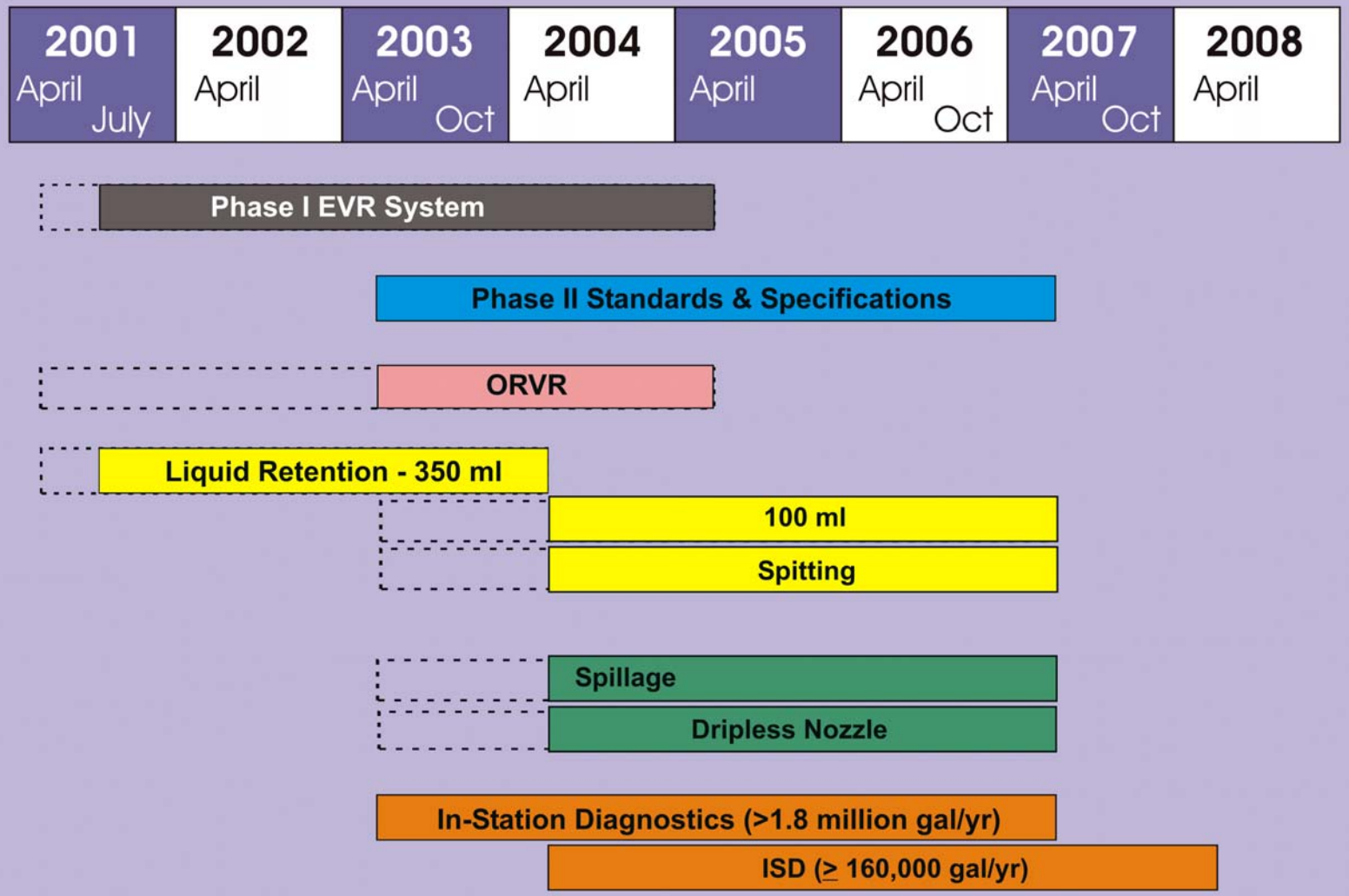
<u>Operative Date</u> – Date when new or modified station must install equipment

<u>Effective Date</u> – Starts the 4 year clock

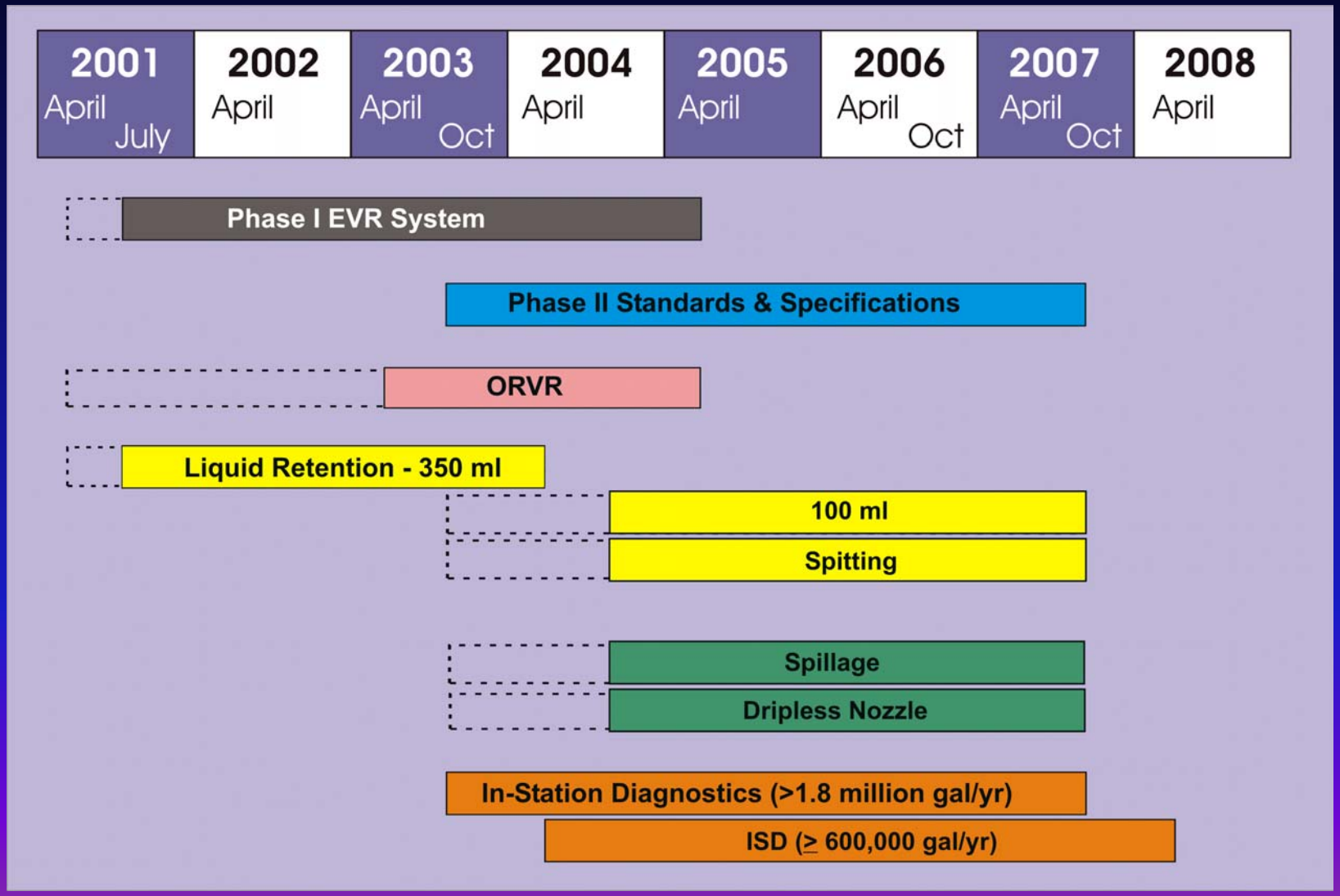
Current EVR Timeline



October Staff Proposal



Proposed EVR Timeline



Allow use of other systems if EVR systems not available

- Certification of EVR Phase II systems not guaranteed by effective date
- Proposal will allow Executive Officer to delay operative date by up to 6 months
- ORVR-compatible systems required

Summary of 15-Day Changes

- Raise ISD exemption throughput
- Modify EVR implementation dates
- Minor changes to certification procedure
- Add technical definitions
- Corrections and clarifications of test methods

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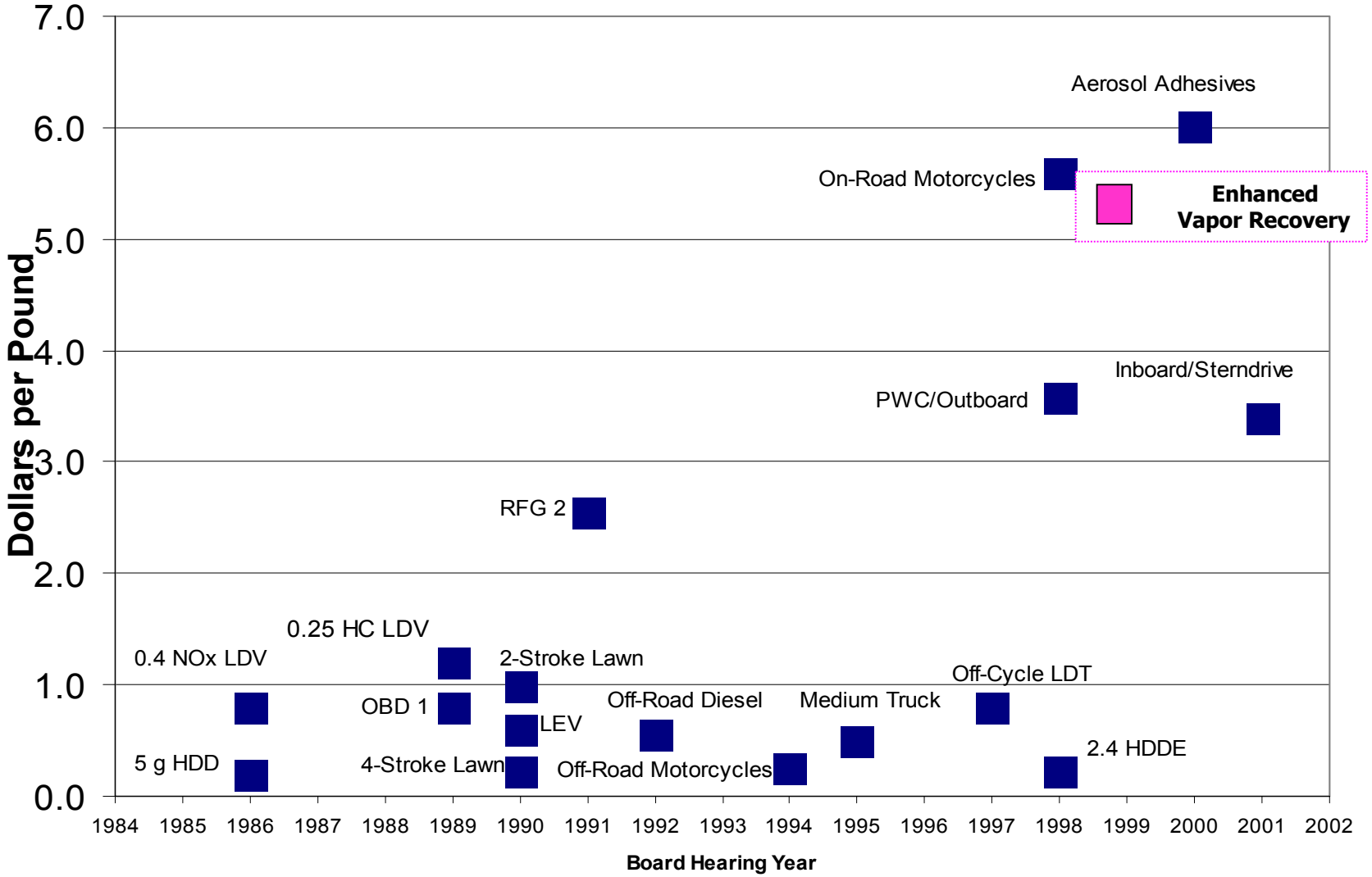
EVR Cost-Effectiveness

	Overall EVR Cost-Effectiveness ($/lb)	EVR Equipment Cost for Typical Station (GDF3)	Statewide EVR Emission Reductions (tons/day)
February 2000 EVR Staff Report	$1.80	$26,908	25.1
October 2002 EVR Tech Review Report	$5.24	$37,566	25.7

Cost Effectiveness of Major Regulations Mobile Sources and Fuel



Outreach

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

Future Activities

- Certify equipment to new standards
- Improve expanded CAPCOA certification review process
- ISD Implementation Review
  - 18 months after first ISD certification

Conclusion

- Proposal developed with extensive outreach
- Adjustments made to address concerns
- Proposed amendments cost-effective