How to Comply with State AST Rules and Avoid Petroleum Discharges to the Environment

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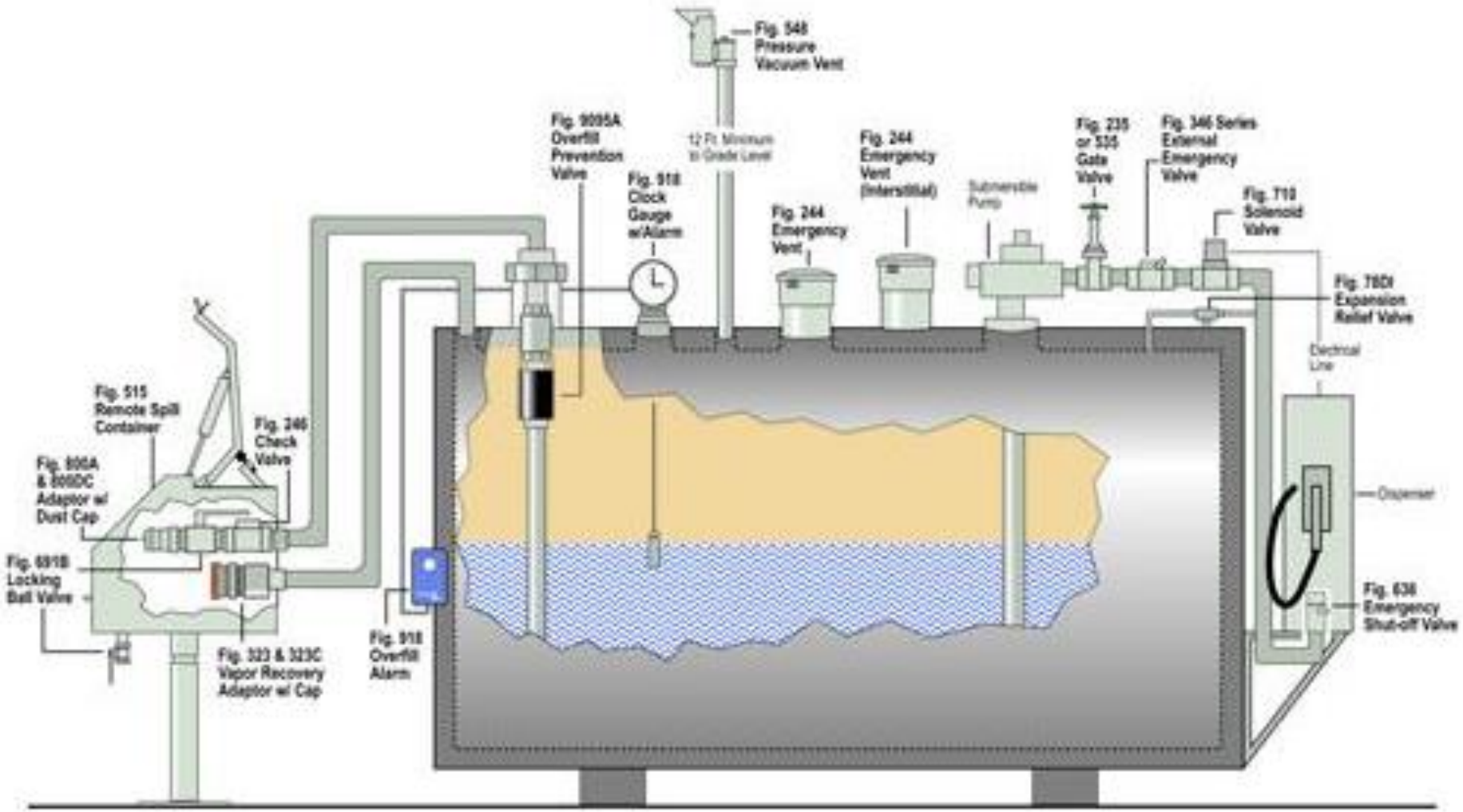
NISTM National Institute for Storage Tank Management

AET Compliance LLC

States Regulate and Inspect <u>Storage Tank Systems</u>



Canadian Tank Inspectors

Reference Standards

Industry Reference Standards – The Technical Foundation of State Regulations

- **ACI - American Concrete Institute.**
- **API - American Petroleum Institute.**
- **ASME - American Society of Mechanical Engineers**
- **ASTM - American Society for Testing and Materials.**
- **NACE - National Association of Corrosion Engineers.**
- **NFPA - National Fire Protection Association.**
- **PEI - Petroleum Equipment Institute.**
- **SSPC - Society for Protective Coatings.**
- **STI - Steel Tank Institute.**
- **UL - Underwriters Laboratories.**

Field-Erected ASTs

Field-Erected AST Installation

Do the job right!

Do the job right with Qualified Personnel!


Tank Shell
DO NOT WELD
NO SOLDAR
LIQ PENT TEST
STOP WELD HERE

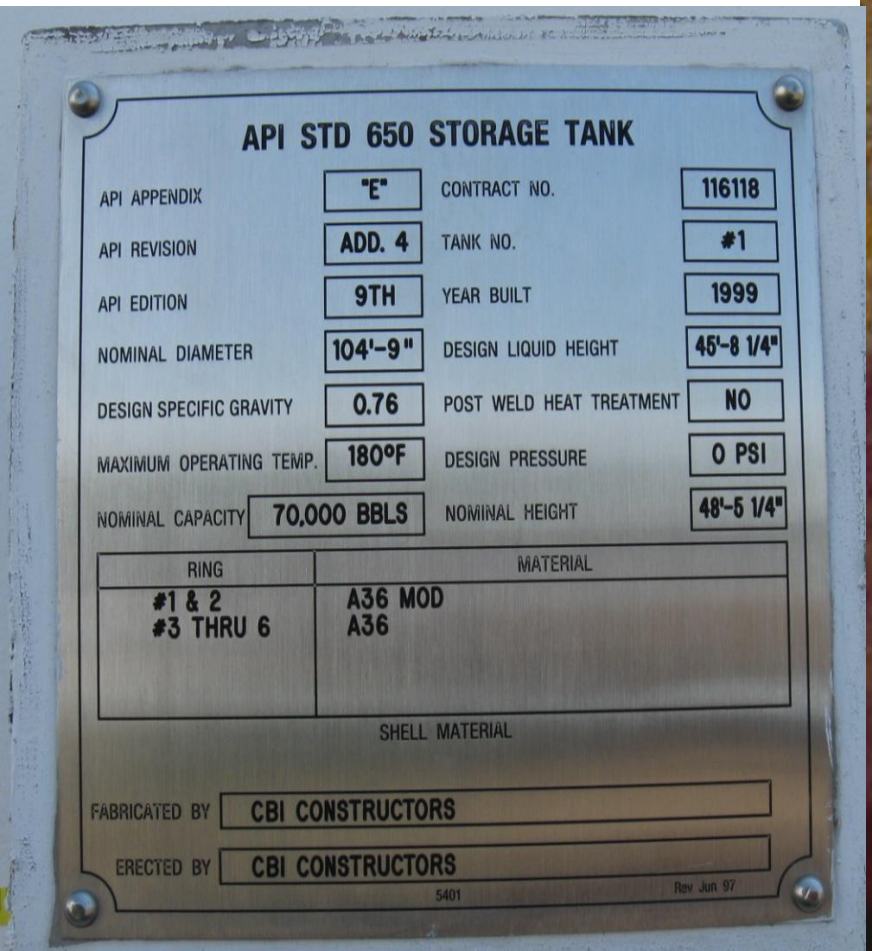

Welding


Bottom plates


Quality work is essential!

Piping Connections, Sumps, Manways, & Shell Penetrations

Reference Standards- API-650



API 650 Work That Doesn't meet the Standards


MAXIM

Final Steps


New Tanks

API 650 Optional/Traditional Double-Bottom Designs

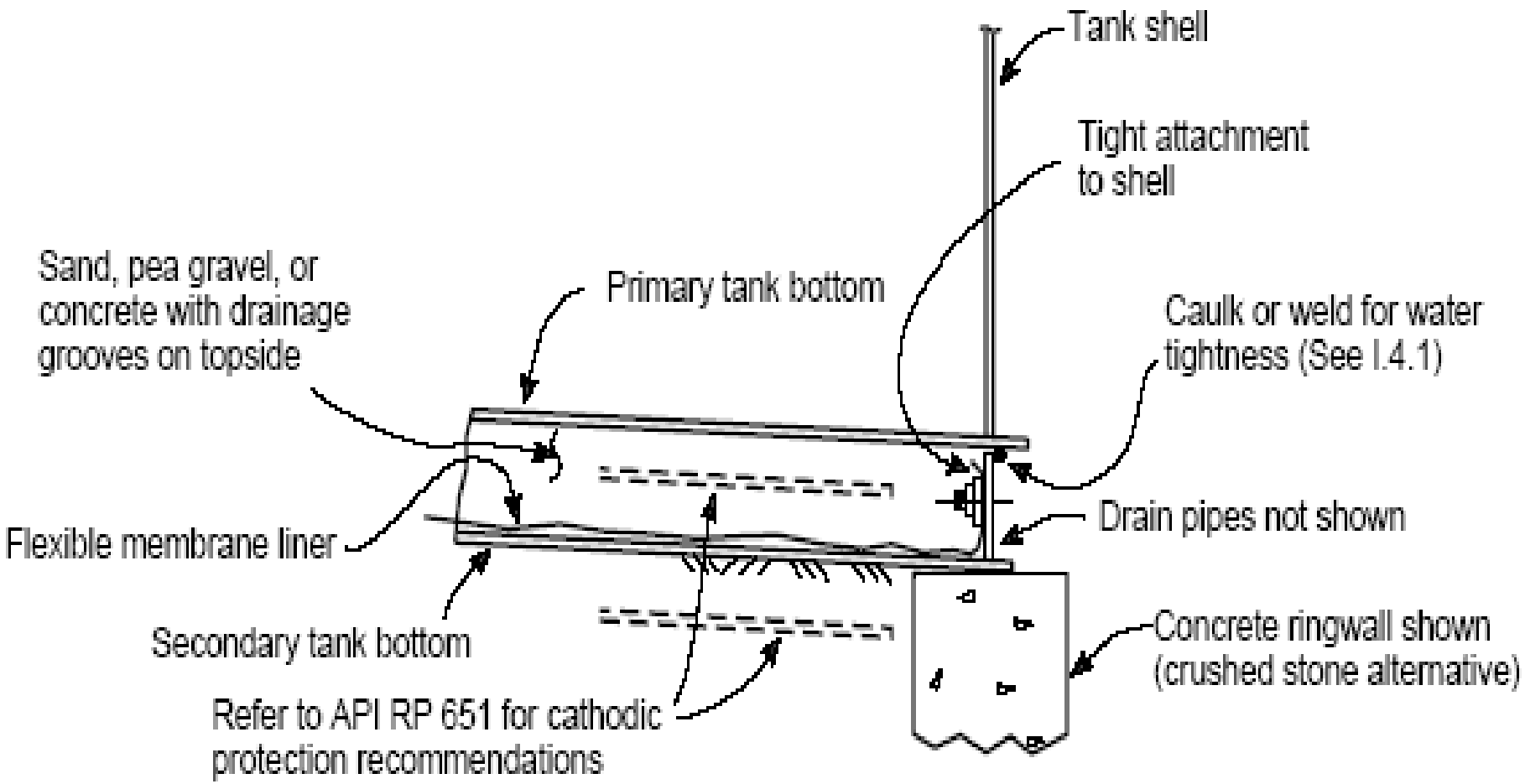


Figure I-4—Double Steel Bottom with Leak Detection at the Tank Perimeter (Typical Arrangement)


German
Double-
Bottom
Design

El Segundo Bottoms

Cone-Down

El-Segundo Designs

- Cone-up
- Cone-down
- Shovel-bottom

Double-Wall Tanks


Port of
Palm Beach


Germany


Port Canaveral

Impervious Synthetic Liners Beneath the Tank

Upgrading Existing Single-Bottom ASTs with Secondary Containment

Internal Secondary Containment Using Parabeam

Tankbau (Germany) Internal Secondary Containment System

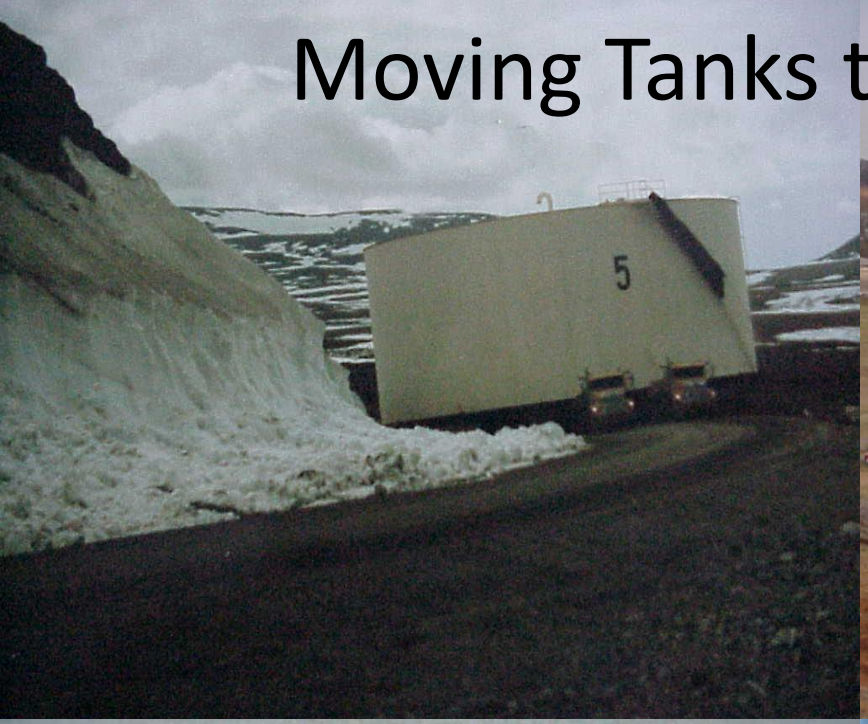
Steel Internal Secondary Containment

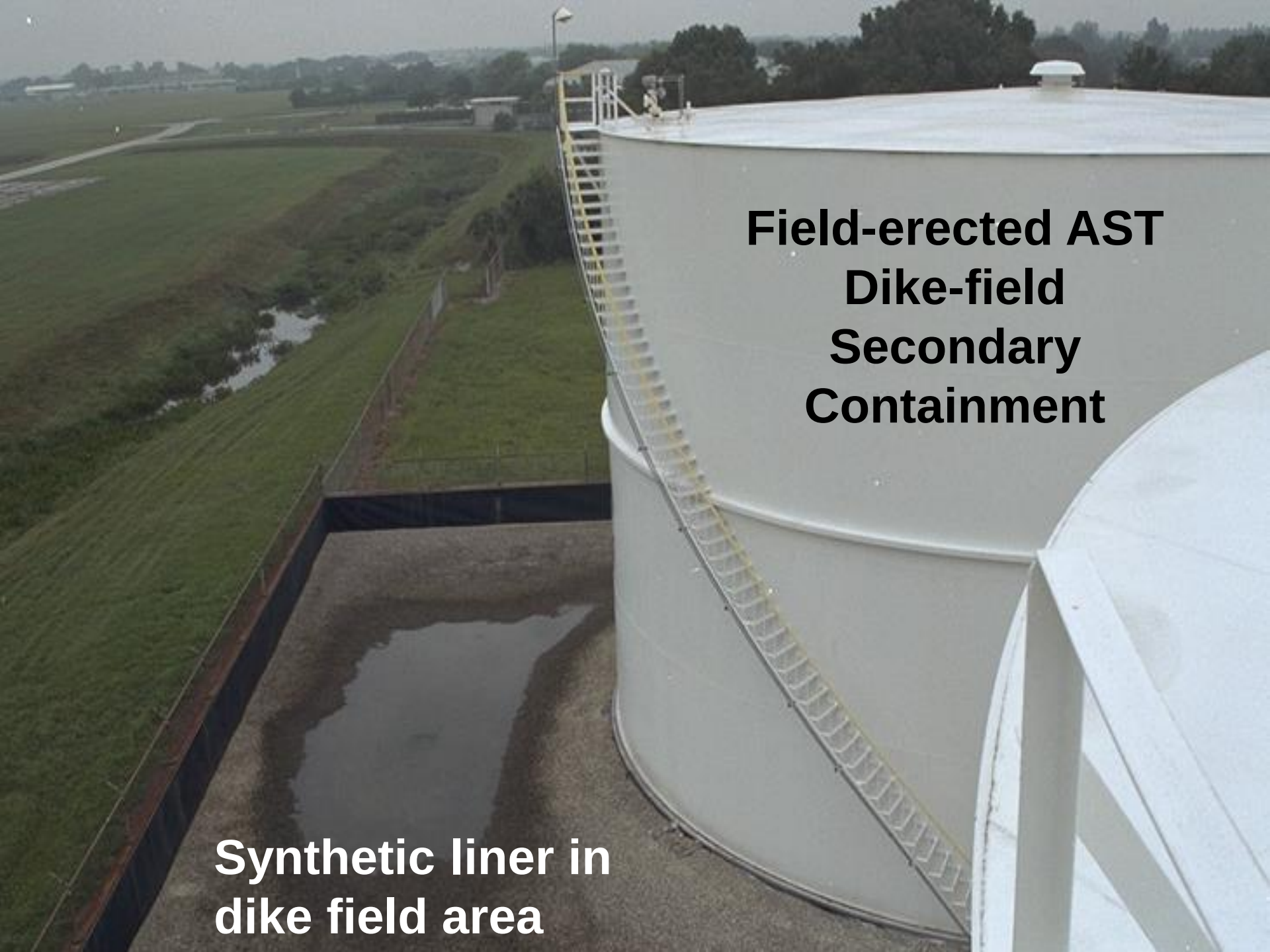
Tank-Jacking to Install Secondary Containment

Field-erected AST Lifting for secondary containment installation beneath the tank


A.R. WATSON, USA
(800) 294-5102

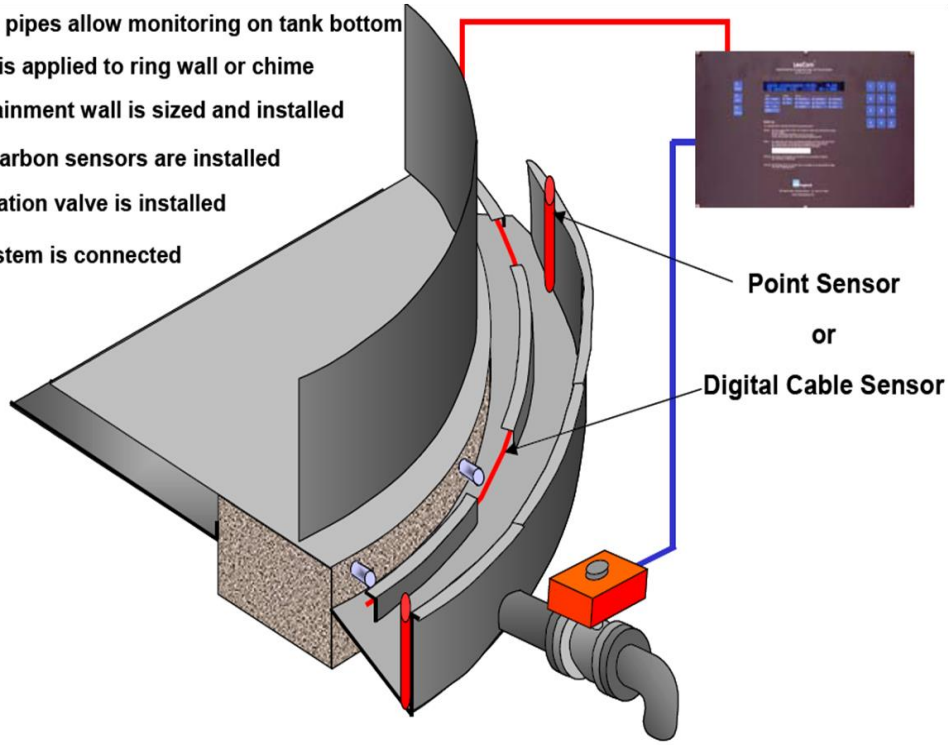
Moving Tanks to Different Locations




Field-erected AST
Dike-field
Secondary
Containment
Synthetic liner in
dike field area

AST Dike-field Secondary Containment - Field-Erected Tanks

- ✓ Telltale pipes allow monitoring on tank bottom
- ✓ A skirt is applied to ring wall or chime
- ✓ A containment wall is sized and installed
- ✓ Hydrocarbon sensors are installed
- ✓ An isolation valve is installed
- ✓ The system is connected



Alternative Dike Field Secondary Containment

Pre-Hydrated Bentonite Clay Liners – "Rawmat" by Rawell

Poly-Urea Liners

Shop-fabricated tank installation


GASOLINE


envirosafe
OVERSIZE LOAD


11:48AM


TANK 1
TANK ID #551N
JP-5
30,000 GALLONS
NO SMOKING

Issues in selecting the type of shop-fabricated tank best-suited for your needs:

- Storage volume needed
- Site security
- Available space
- Piping needs
- Dispensing needs
- Portability
- Regulation
- Cost
- Operation and maintenance issues
- Risk assessment – fire safety, hurricanes, etc

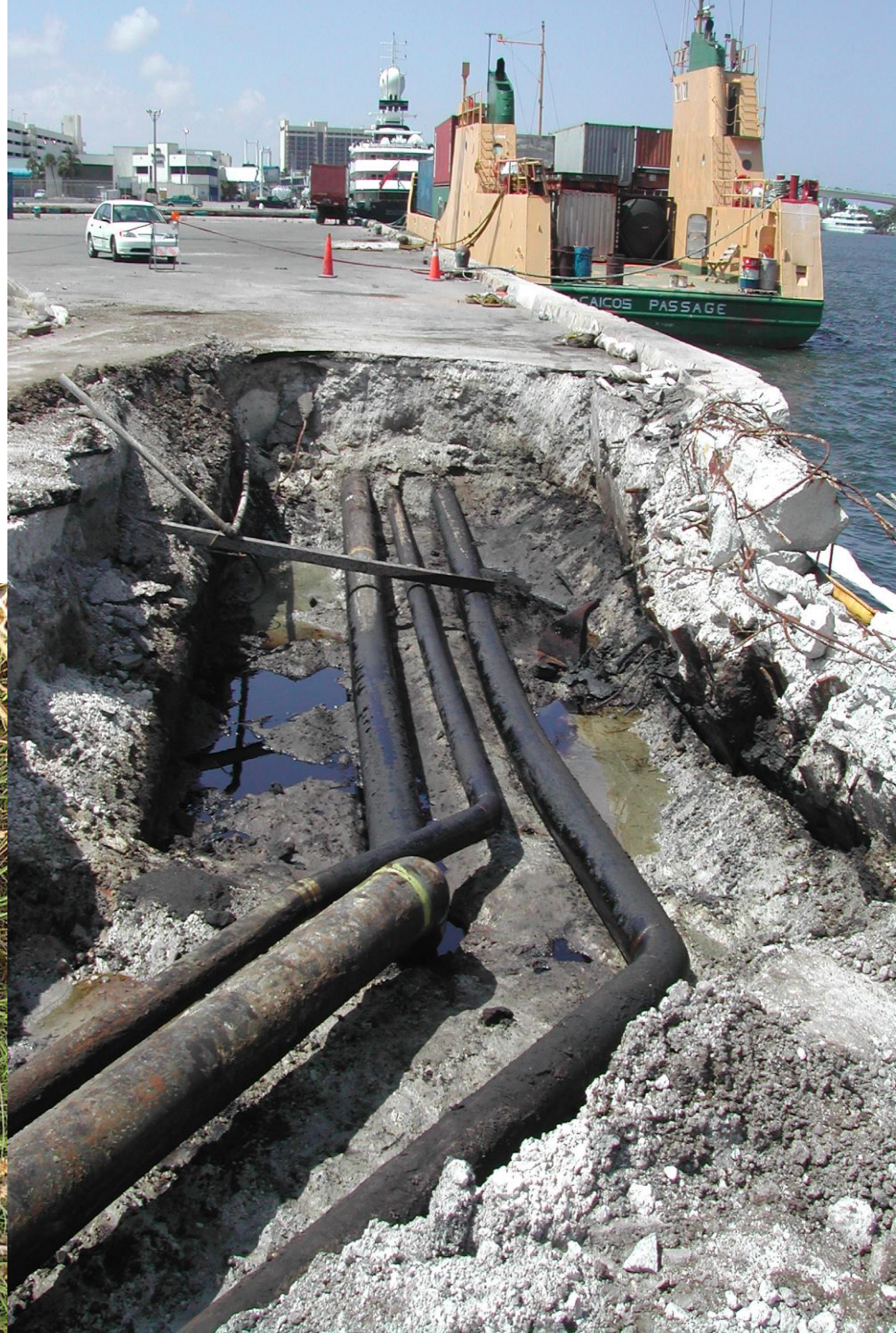
Shop-fabricated ASTs should have secondary containment at the time of installation

AST Secondary Containment - Shop-fabricated Tanks

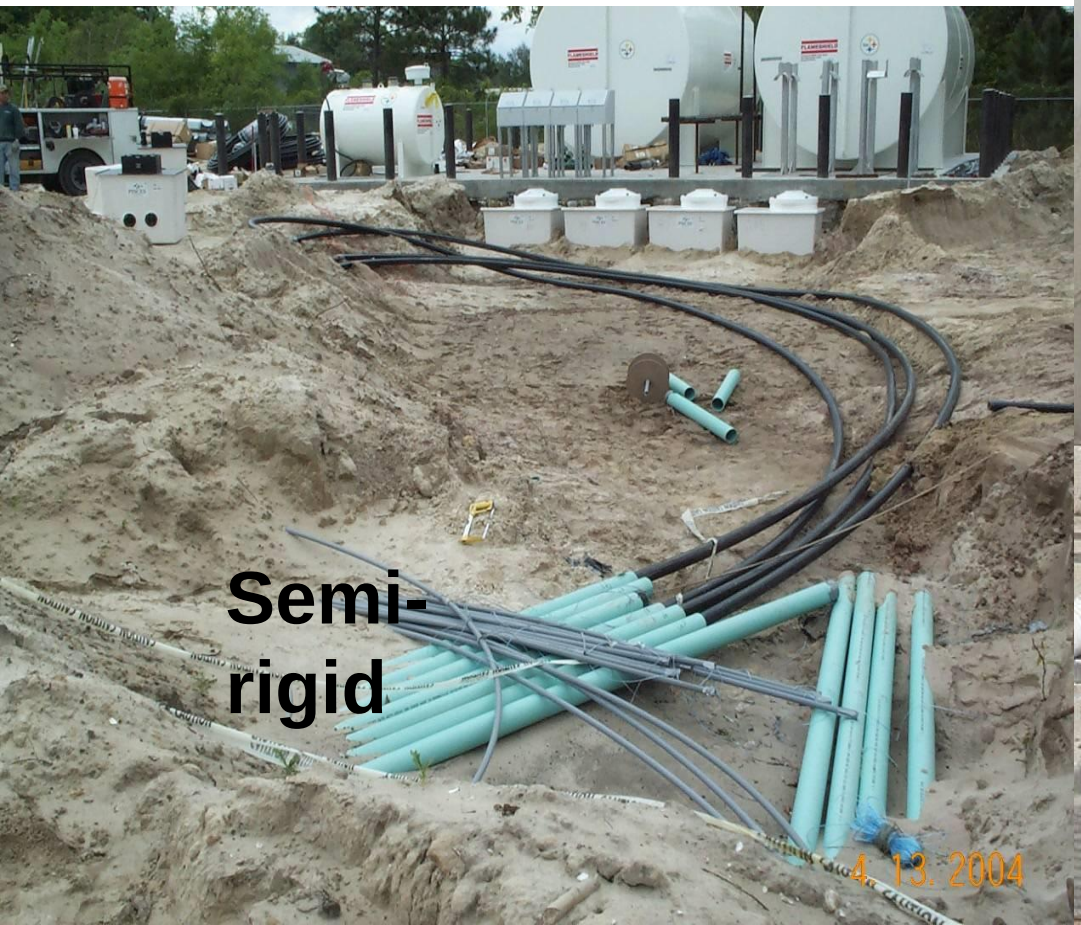
Piping

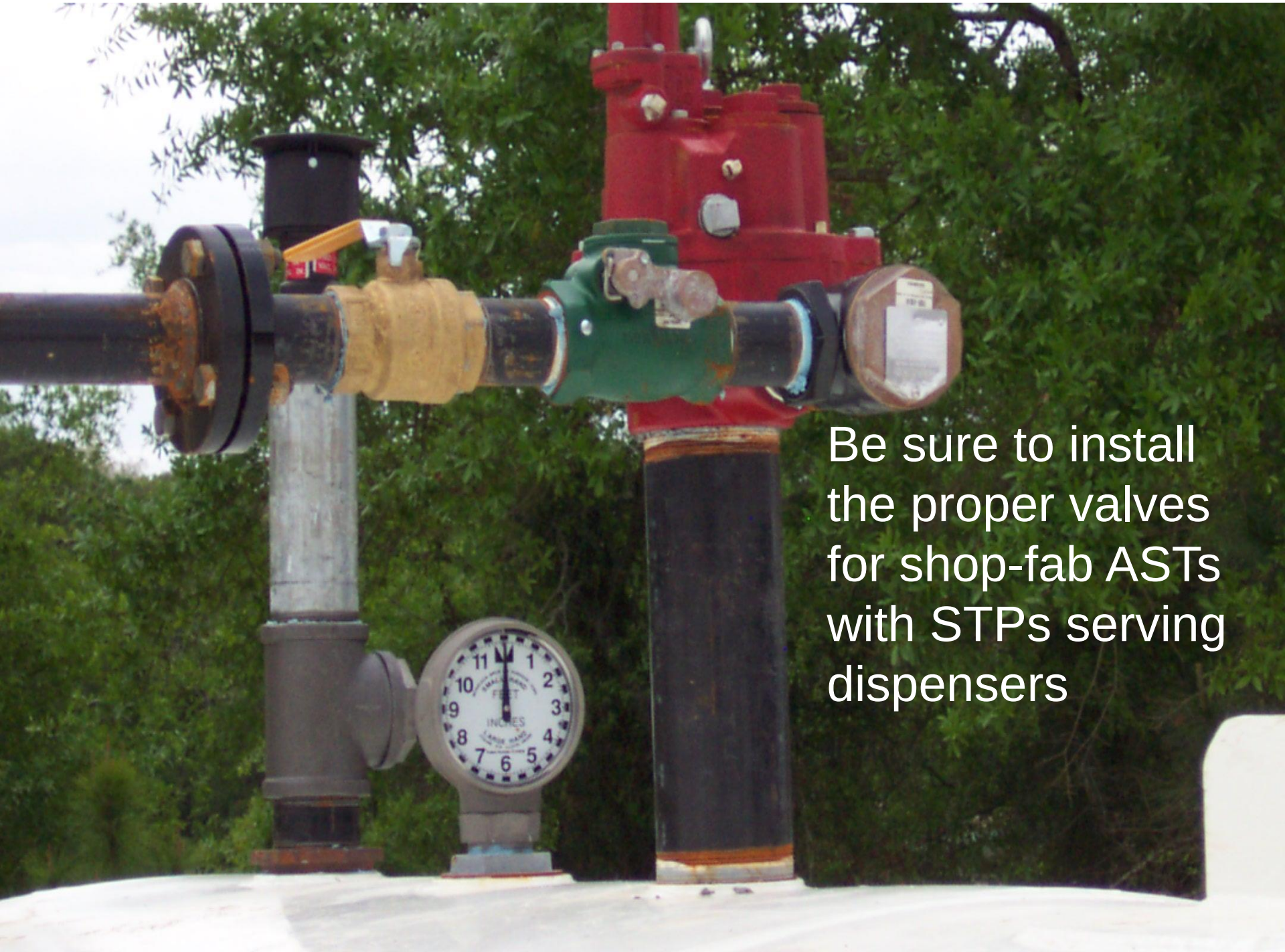
Piping -

The major source of Field-erected AST leaks...



Small Diameter Piping with Secondary Containment




Be sure to install the proper valves for shop-fab ASTs with STPs serving dispensers

Single-wall Large Diameter Piping Above Ground

Steel Bulk Product Piping with Secondary Containment for Piping in Contact with the Soil



Steel Bulk Product Piping with Secondary Containment - Installation concerns

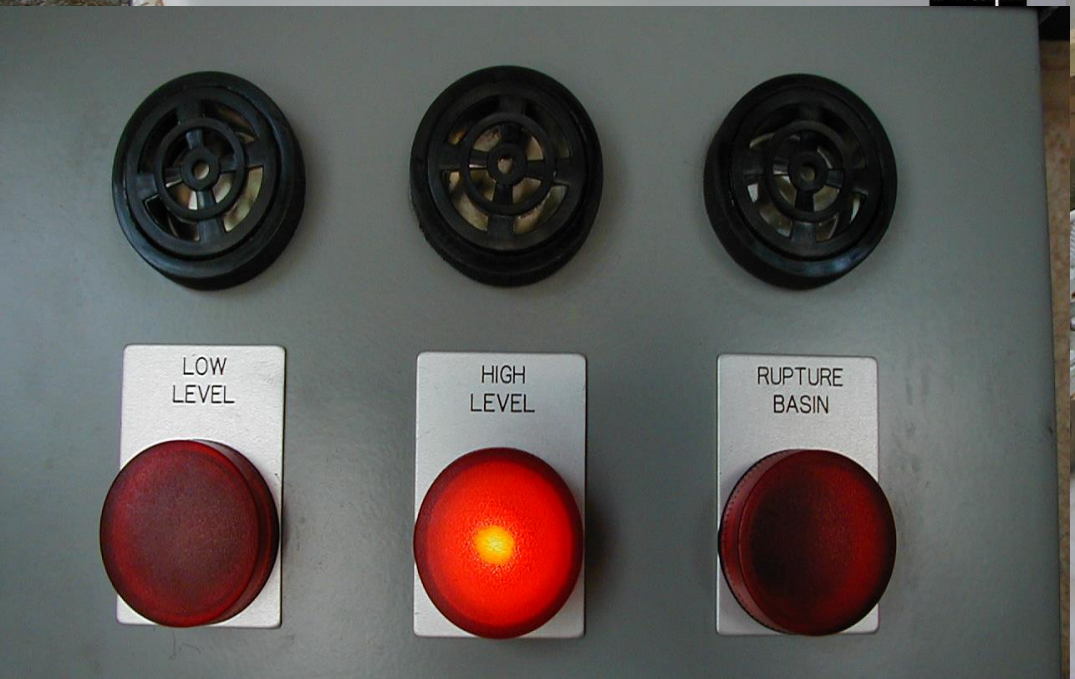

HDPE Pipe
Semi-Rigid Pipe
UPP
Rheomax

IPP HDPE Semi-Rigid Petrol Pipe

Airport Hydrant Piping

AST Spill Protection

AST Overfill Protection



Release Detection Standards

Internal Release Detection for Single-wall Systems

NONE

External Release Detection for Single-wall Systems

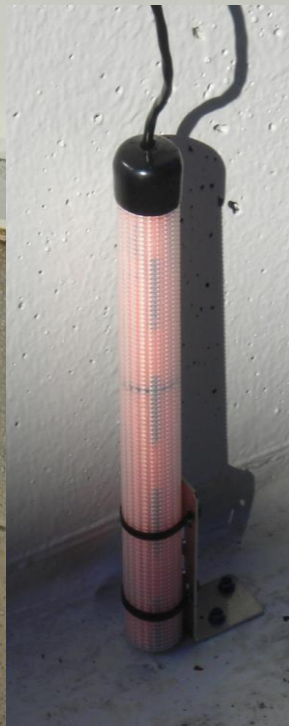
- Well construction
- Site Suitability
- Groundwater monitoring wells
- Vapor monitoring wells

Release Detection for Double-wall Systems

Internal
Interstitial
Monitoring

- Visual
- Vacuum
- Pressure
- Hydrostatic
- Sensors & Probes

Leak Detection with Interstitial Monitoring for Tanks and Piping

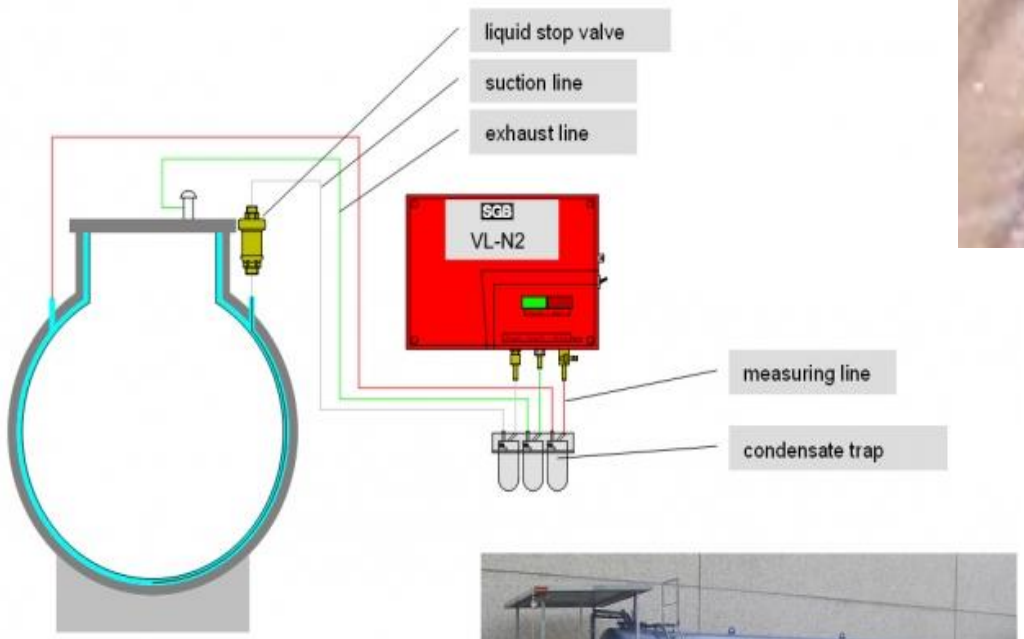



PLUS!
VEEDER-ROOT
TLS-350

Recommendation for Release Detection…

“First Class” Version

Vacuum or Pressure Continuous Monitoring



The “Economy” Version

Visual Inspections!

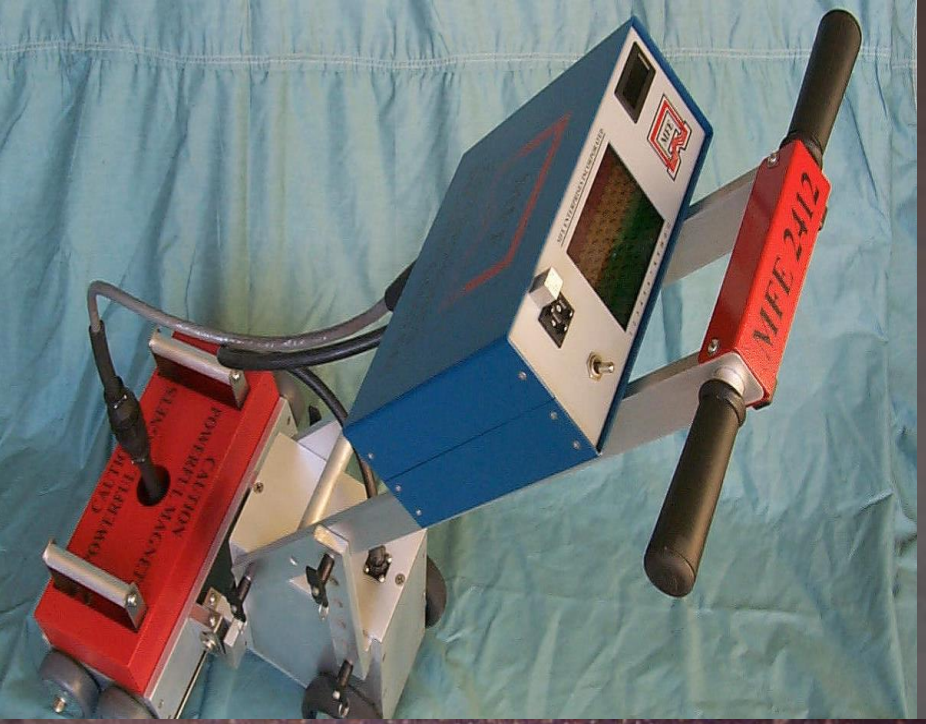
General Operation & Maintenance

Piping connection drip-protection

Stormwater Management

Stormwater retention and removal , and dike field liners

API 653 Inspections



API 570 tests for Bulk Product Piping

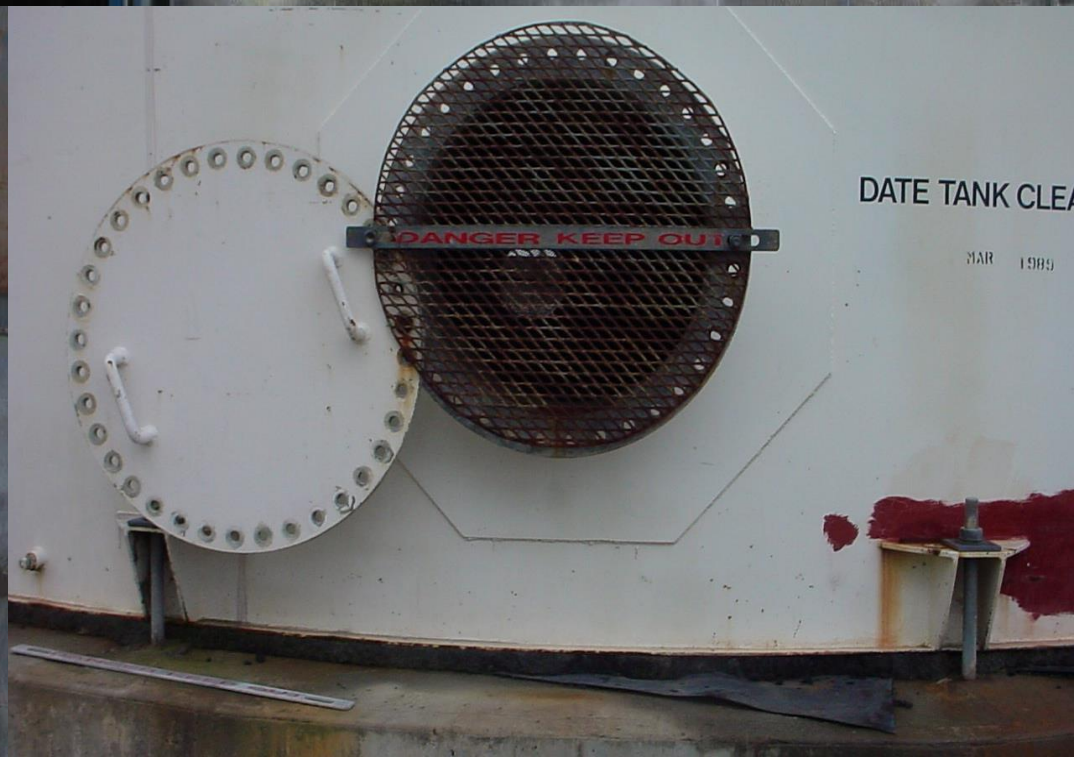
Unusual Situations

RecordKeeping

- **Keep a spiral notebook of visual inspections**
- **Keep a tabbed notebook of all other records required by the State**
- **Photo-document if possible**
- **Keep Registration Information up-to-date**
- **Commercially available recordkeeping systems**

Out-of-Service and Closure Requirements

AST Out-of-Service



AST Closure

Two Choices – Removal, or abandon-in-place


KOMATSU


KOMATSU


3

Closure Assessments

Recommendation: Hire a qualified, experienced professional environmental consulting firm

Incident and Discharges

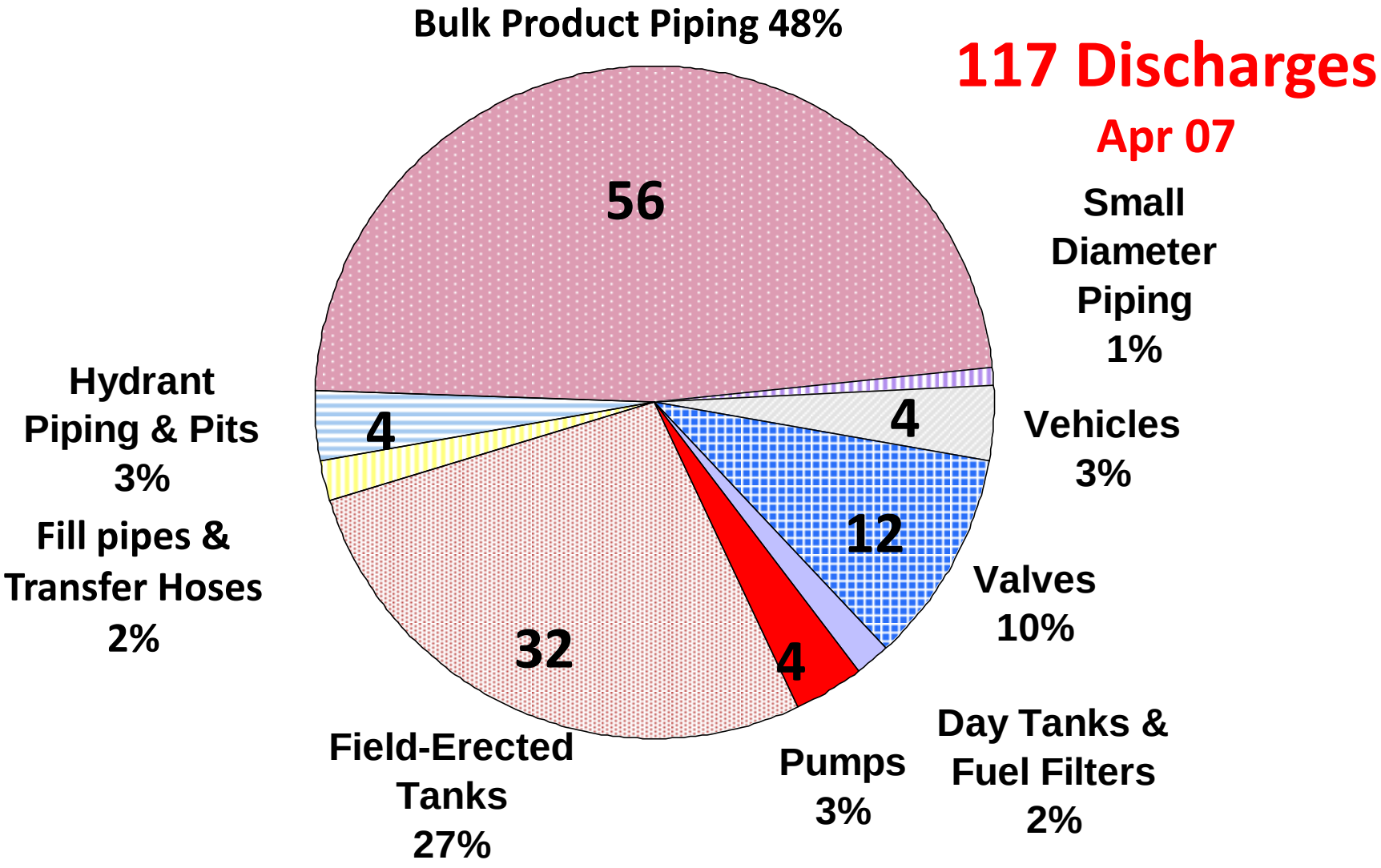
Incident and Discharge Reporting

Discharges

Incidents

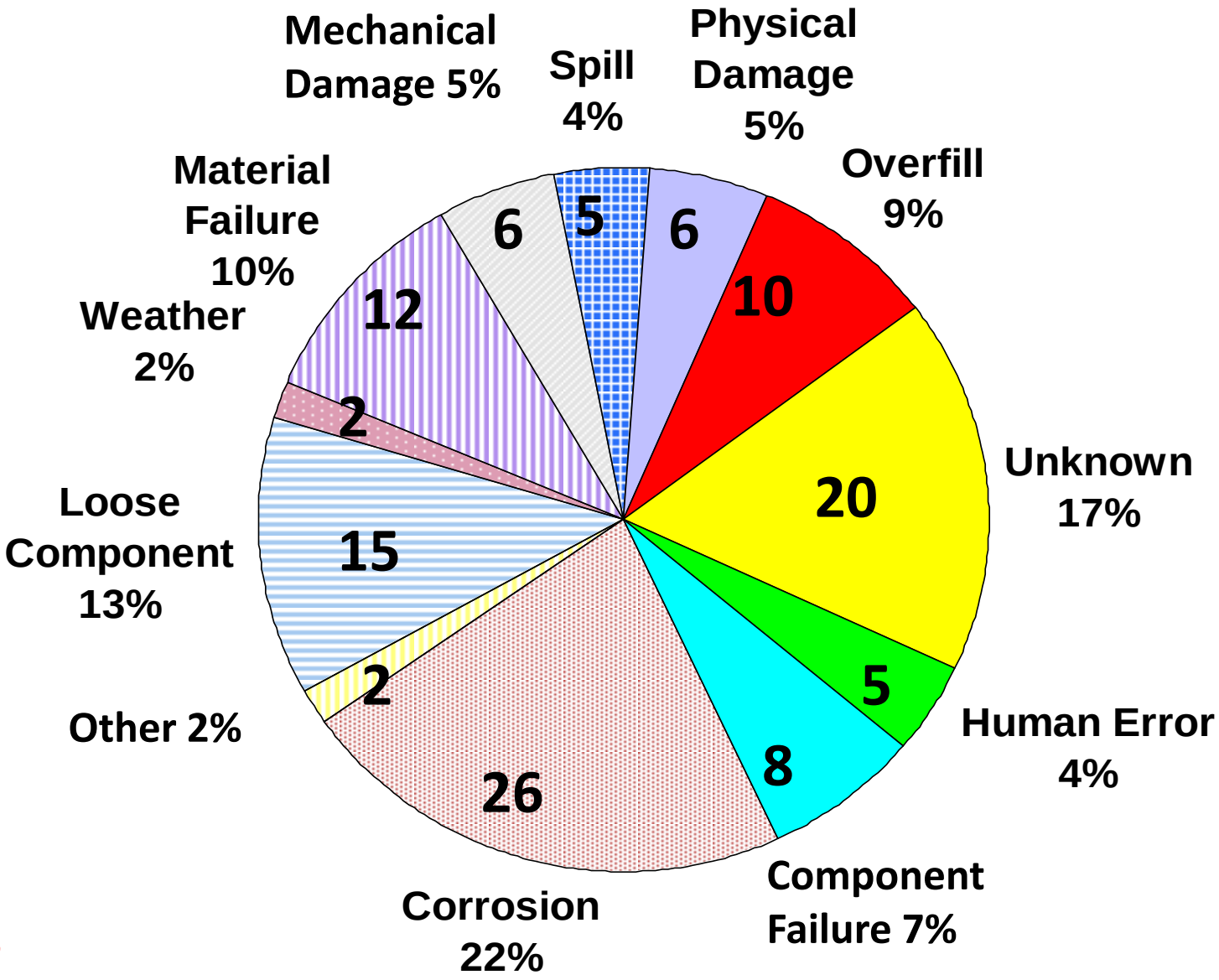
Release or Discharge Response – Complete discharge form within 24 hours or the close of the next business day – control and abate the discharge

Sources of Discharges - Field-Erected AST Systems



Tanks are only 17% if overfills and other external factors are excluded

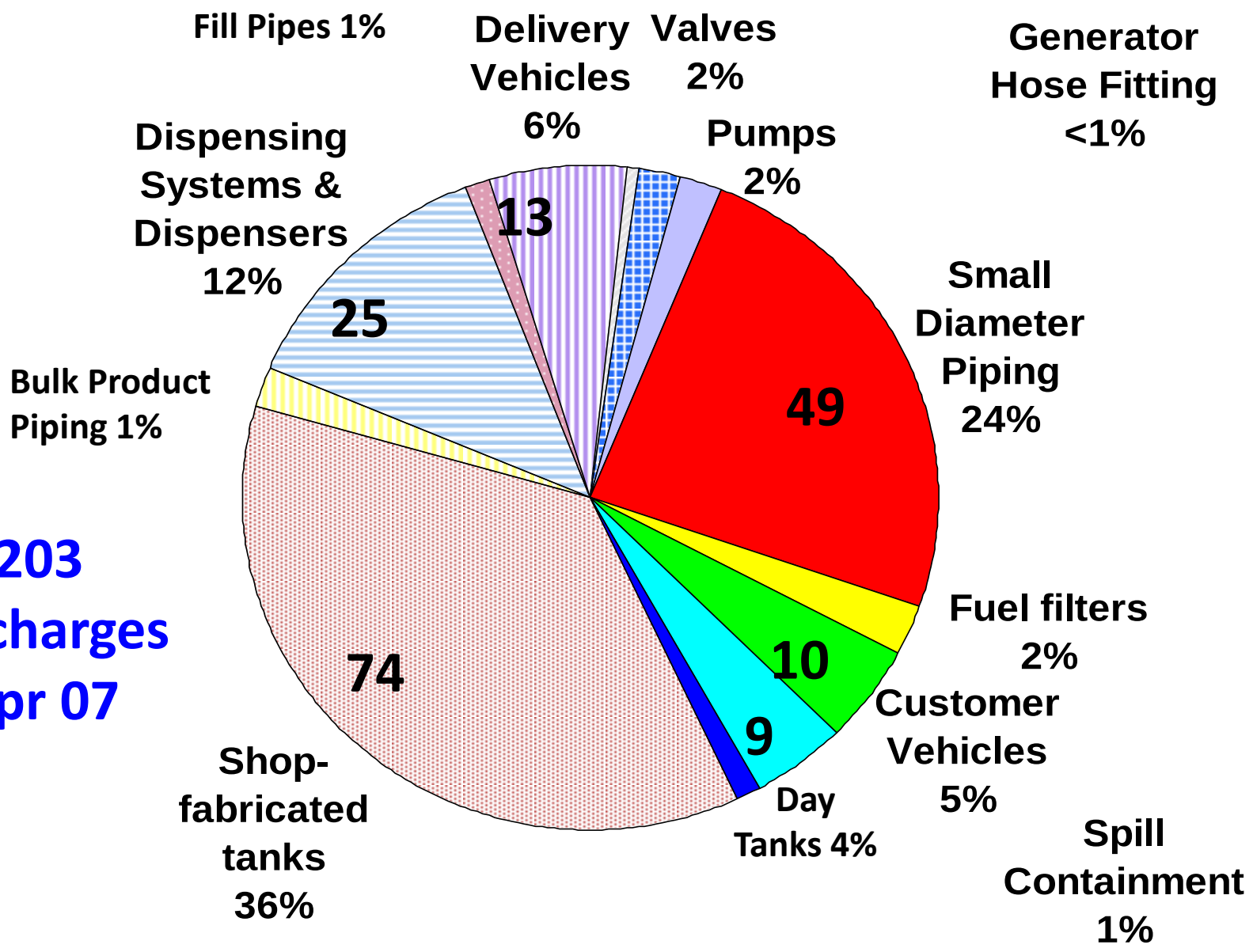
Causes of Discharges from All Sources



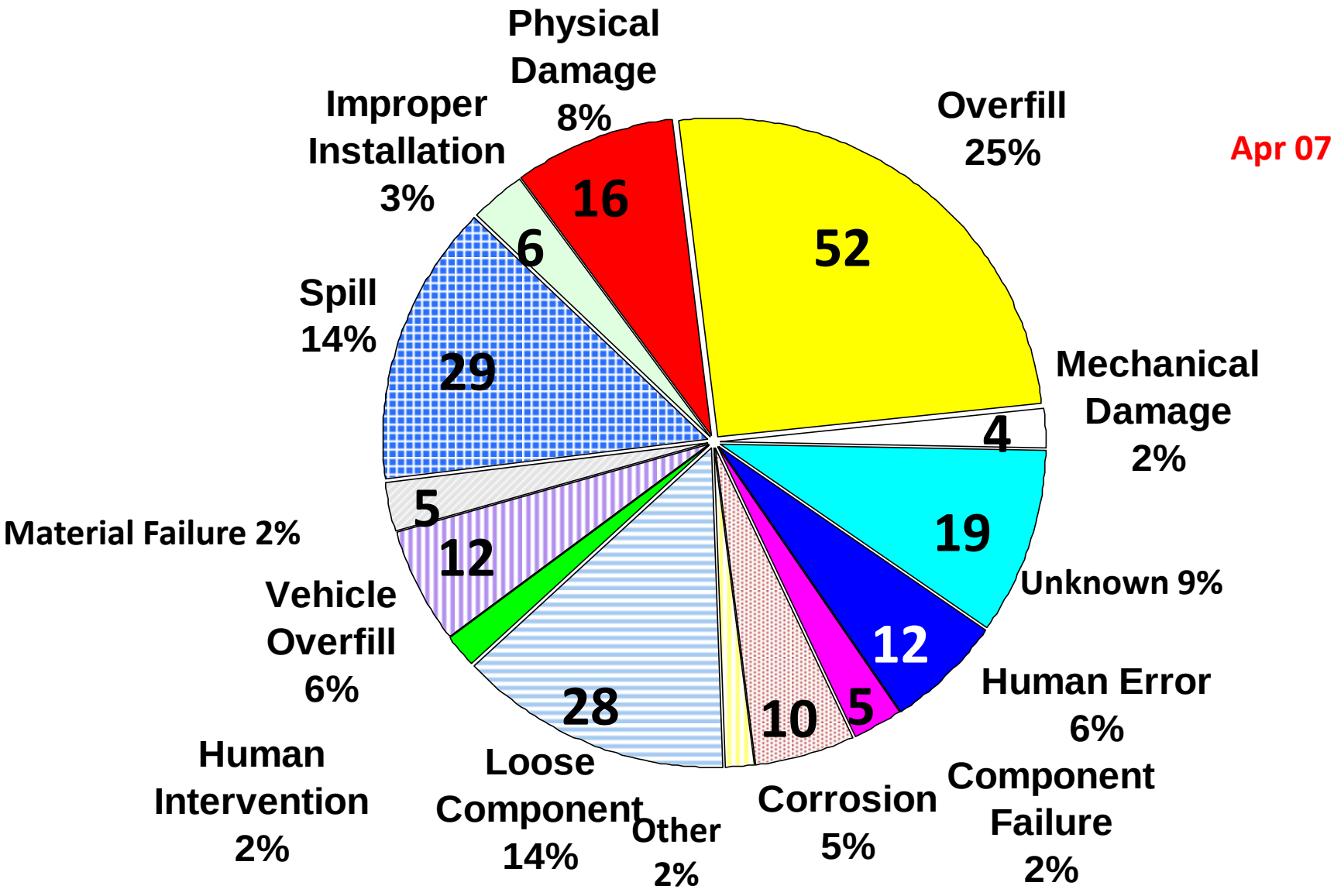
Apr 07

Field-Erected AST Systems

Sources of Discharges - Shop-fabricated ASTs



Causes of Discharges from All Sources



Shop-fabricated AST Systems

Shop-Fab Fires & Explosions


Buncefield, England, 2005

The End