



NEW HAMPSHIRE
DEPARTMENT OF
**Environmental
Services**



Delivery Overfill Prevention

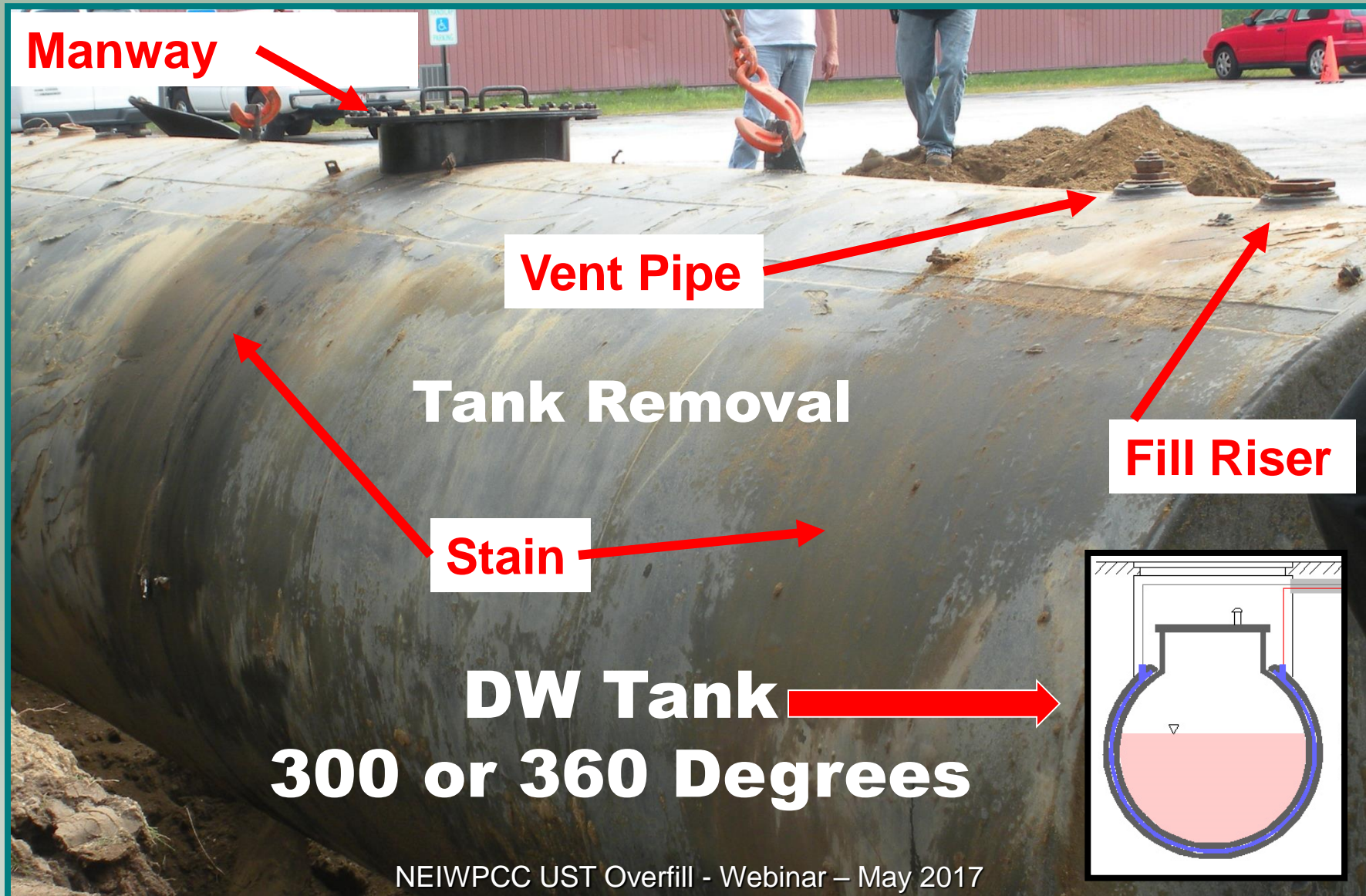
Spruce C. Wheelock
UST Operator Training Specialist



Content

- **Operation**
- **Manual inspections**
- **Confirm operation**
- **Compromised devices**
- **Problems**

Mechanism which stops, restricts, or alerts prior to wetting the inside top of the tank



Overfill Device

- Rule considerations:
- Stop, or restrict, or alert
- Accessible for inspection (NH)
- Compatible delivery method
- Register primary device (NH)

New Hampshire Department of Environmental Services
29 Hazen Drive
P. O. Box 95
Concord, New Hampshire 03301 (603) 271-3644
FAX (603) 271-2181



1-may-2003

Registration for Underground Storage Tank Systems

Type of Registration	State Use Only		
Instructions: Please type or print in ink all items except "signature" in Section VII. This form must be completed for each location containing underground storage tanks. If more than four (4) USTs are owned at this location, photocopy the following sheets, and staple additional sheets to this form. Also, provide a site plan and facility layout. (May be an accurate hand sketch).	ID Number: _____ Site Number: _____ Date Received: _____ <table border="1"><tr><td>Active Tanks:</td><td>Closed Tanks</td></tr></table>	Active Tanks:	Closed Tanks
Active Tanks:	Closed Tanks		

NH Inspects for compatibility!!

Devices



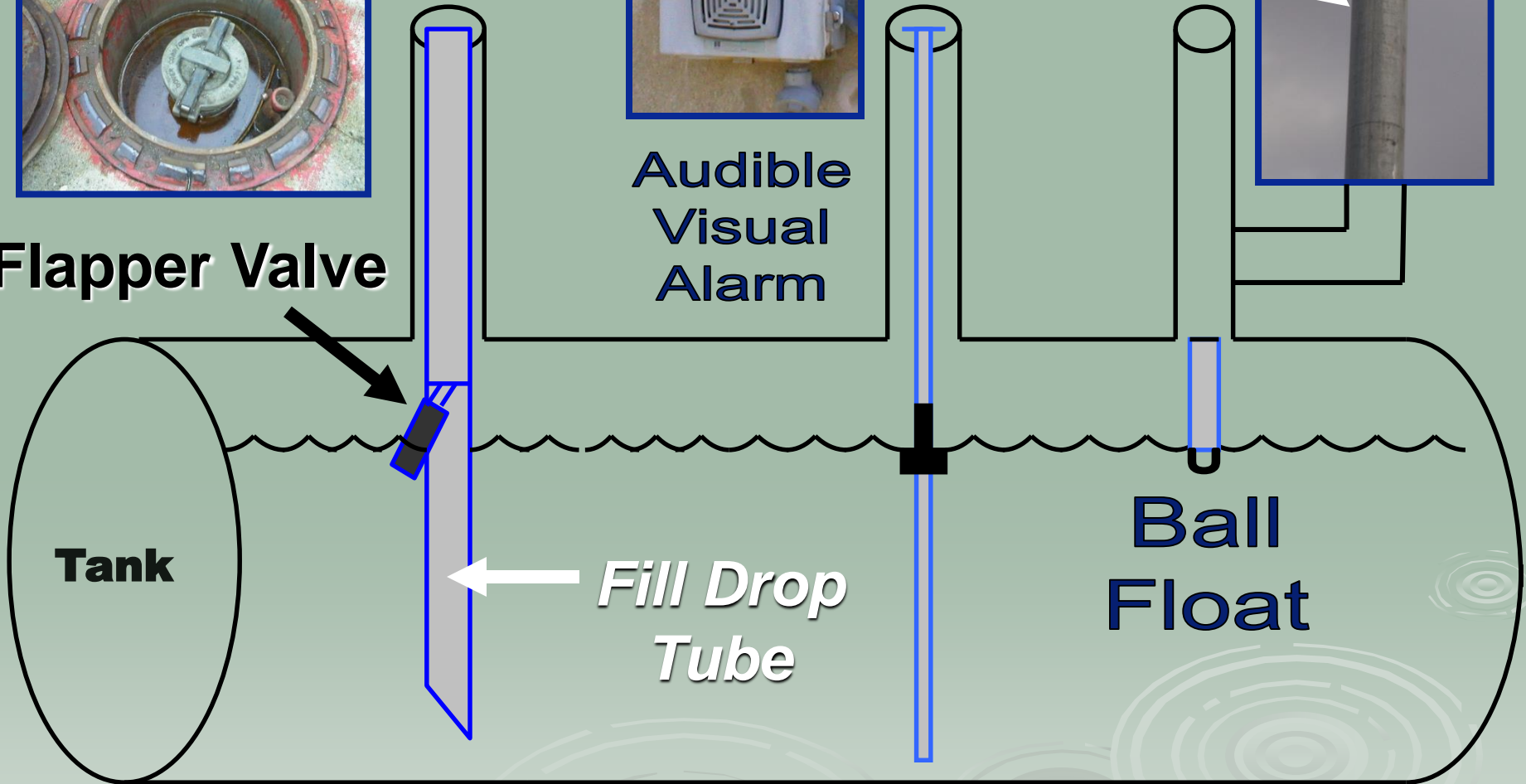
Flapper Valve



**Audible
Visual
Alarm**

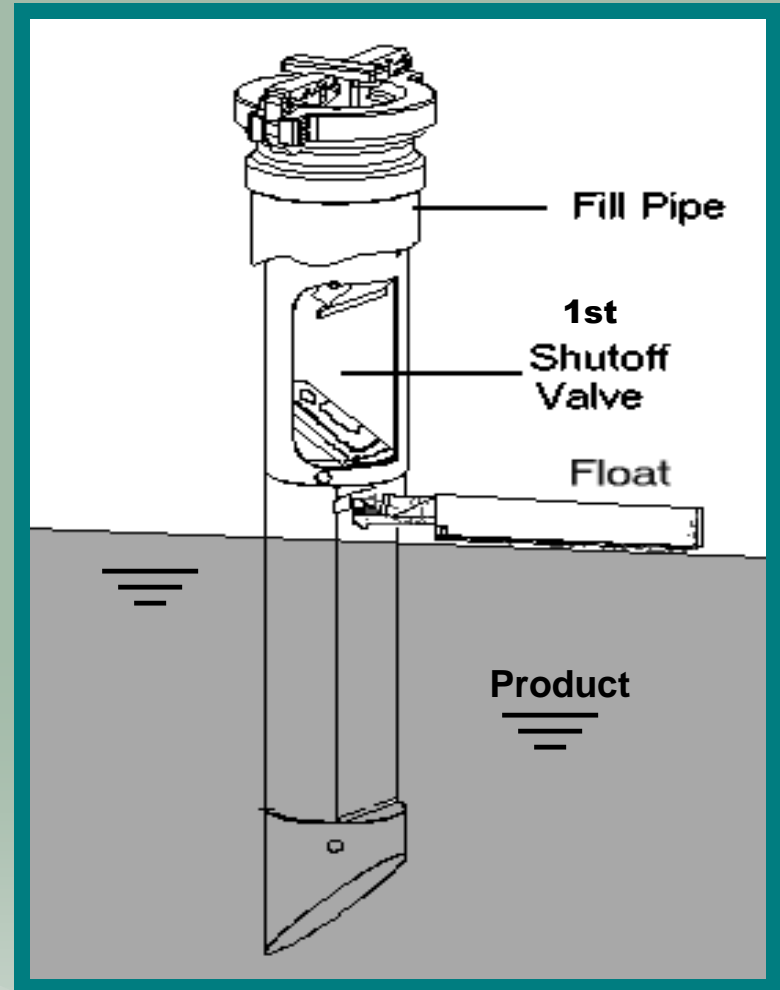
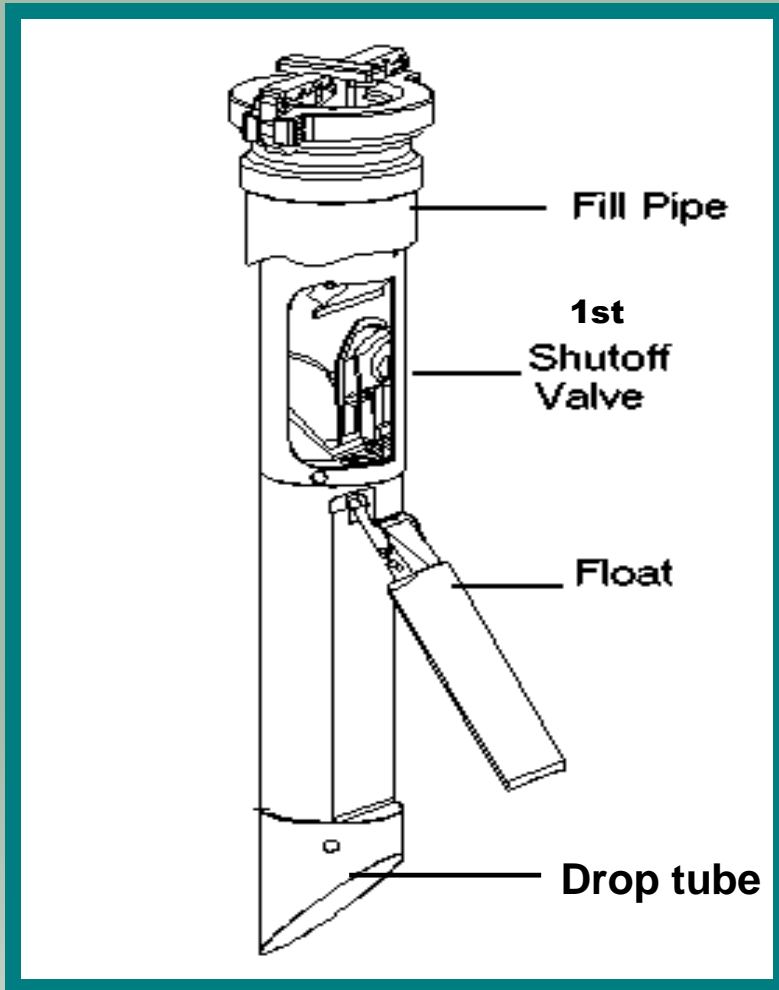


Vent



Flow Stop Device = 95% max level

Flapper Valve 2 stage (installed in fill drop tube)

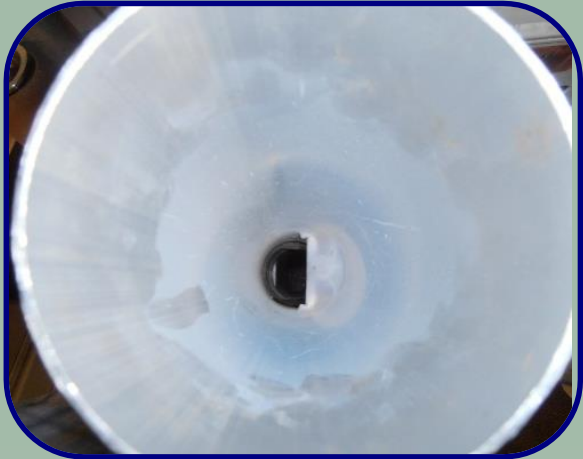


1st Shut off from 300 gpm down to 5 gpm then shut off

Slam Shut +/- 300 gpm



Cut away



**Look down
fill tube**

Different Manufacturers



**OPW
61SO / 71SO**



**EMCO
Wheaton
Guardian
A1100**



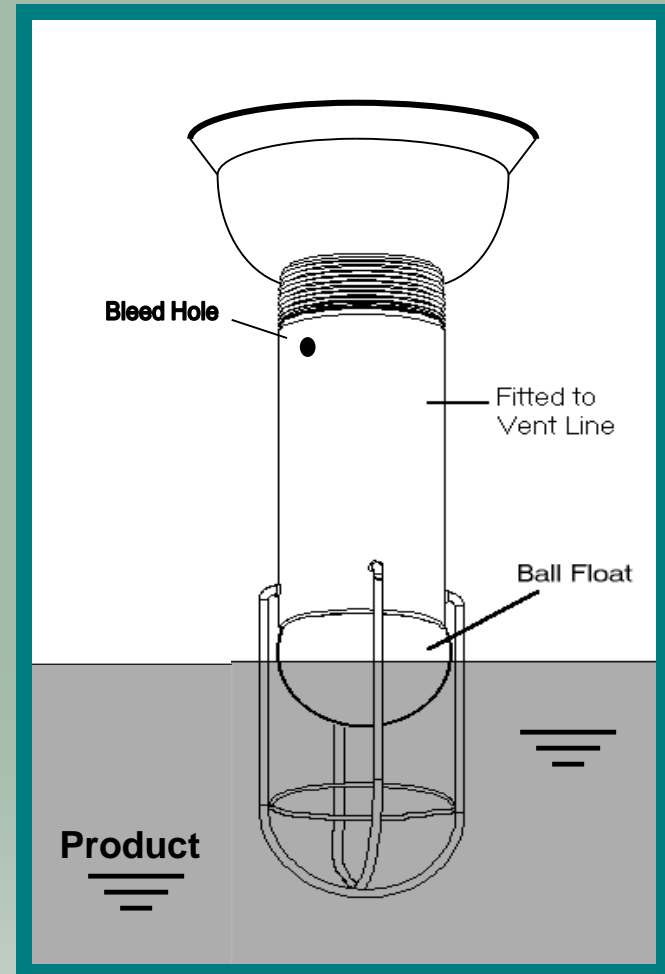
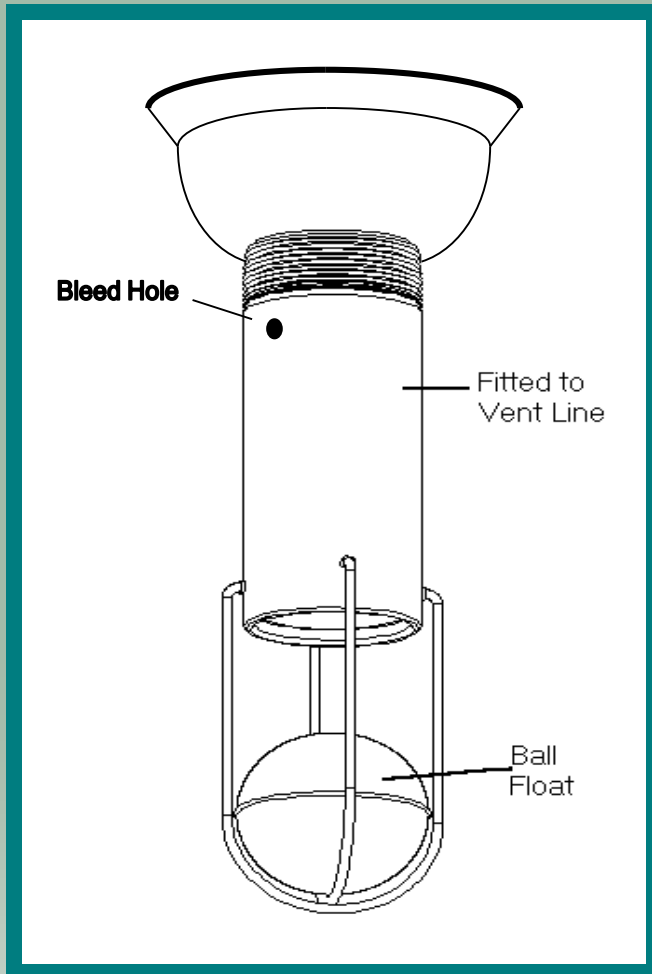
**EBW
Auto
Limiter II**



**Franklin
Fuels**

Flow Restricting Device = 90% fill level

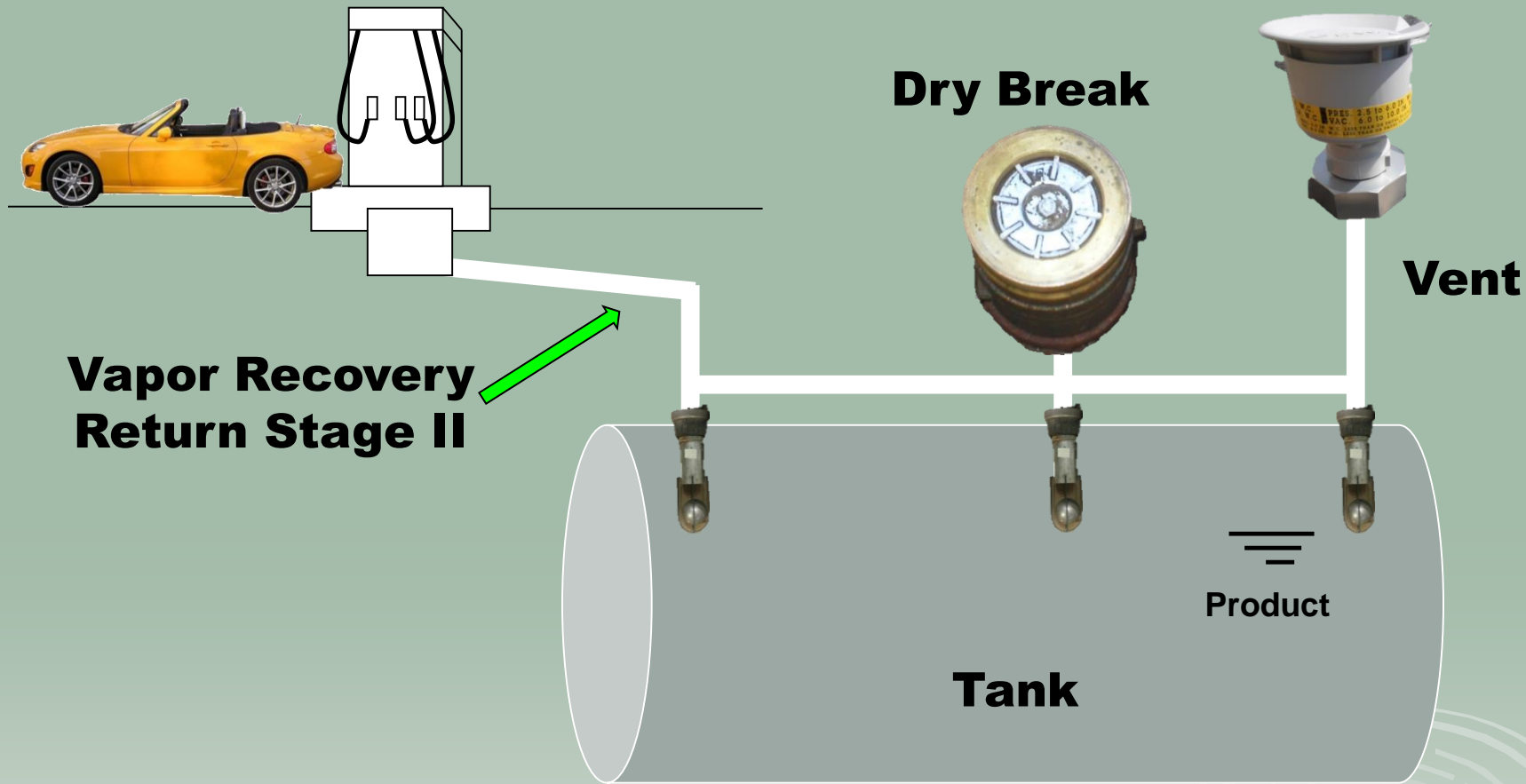
Ball Float (installed in tank at all vent locations)



1st Shut off from 300 gpm down to 5 gpm for ever

Flow Restricting Device = 90% fill level

Ball Float (installed in tank at all vent locations)



End of Ball Floats-Moving Forward

- EPA -- End of flow restrictors on vents
 - Look at flow restrictors on other locations such as the fill.

Not !!
Flow Stop
device

UNIVERSAL

Open



Closed

Float Swings
Sideways

Alert Device = 90% fill level

High Level Audible/Visual Alarm (NH req. both)



Horn



Light



NH Primary high level alarm

- **Visual** until manually reset
- **Audible** can automatically shut off after **10 seconds**.



NH Primary high level alarm

Overfill alarm for each compartment
**if 2 or more compartments
are filled at the same time**



**If only one audible/visual unit
field test the reset**

Gravity Delivery Method



Regular

4" hose
20' long =
14 gallons

300-400 gpm



Loose

Pressure Delivery Method

Pumped
(30-75 psi)
40-300 gpm



Tight



Loose

Device-Delivery Compatibility

➤ Audible/Visual Alarm (AA)



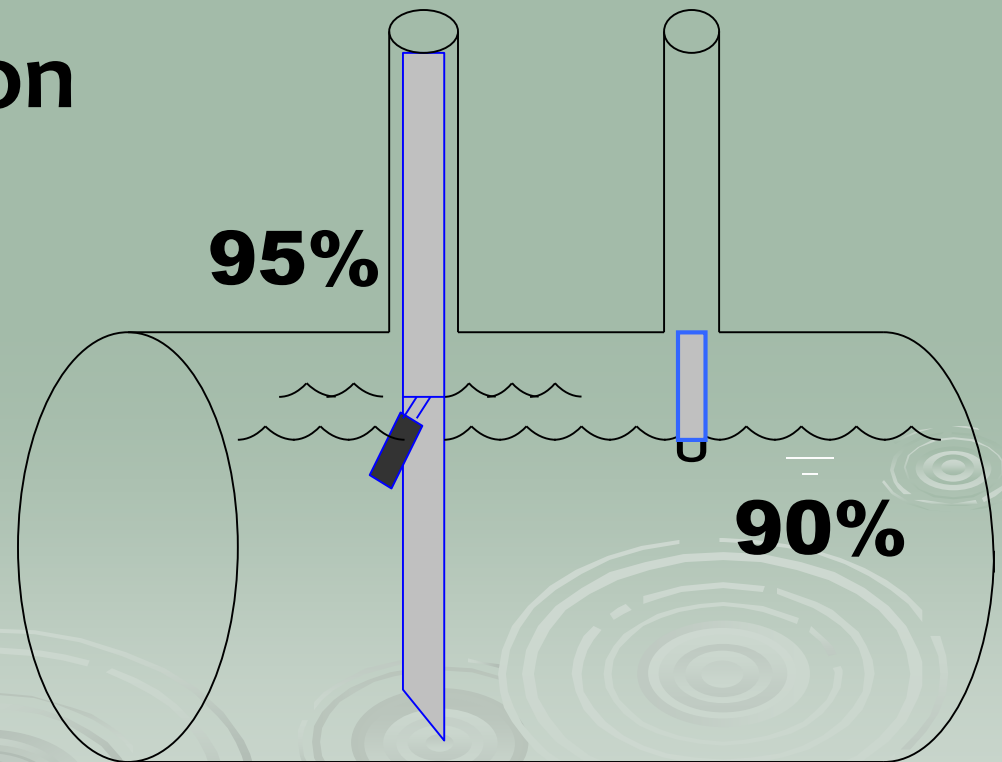
The only device type that will work for both gravity and pressure deliveries!



Device-Delivery Compatibility

➤ Flapper Valve (FV)

- Gravity only
tight connection
- Can not have
ball floats!!!!



Device-Delivery Compatibility

➤ Ball Float (BF)

- Gravity only - tight connection
- Multiple BF per tank (vent, dry break, vapor recovery)!!!!

Can not use with:

- Coaxial drop tube
- Suction pump-dispenser
- (air eliminator)



Compatible Devices

<u>Overfill Device</u>	<u>Delivery Method</u>		<u>Fill Connection</u>	
	Peddle Truck (Pressure)	Tanker (Gravity Drop)	Tight (Gravity Drop)	Loose
AA 90%	Yes	Yes	Yes	Yes
FV 95%	No	Yes	Yes	No
BF 90%	No	Yes	Yes	No

Some States allow Vent Whistle on small tanks

Compatible Devices

<u>Overfill Device</u>	<u>Tank System Pump Type</u>		<u>Vapor Recovery</u>	
	(Pressure)	Suction with (dispenser)	Two Point	Coaxial
AA 90%	Yes	Yes	Yes	Yes
FV 95%	Yes	Yes	Yes	Yes
BF 90%	Yes	No	Yes	No

Questions



NH Overfill Device Testing

Verify proper operation & Installation
NH requirement no later than
December 22, 2017 then every 3 years.



Ball Float OPW

Standard Ball Float

1/8" Bleed
hole

4 Prong cage
with bleed
holes



30 Minute
30VML

Gasket (*missing*)

1/16" Bleed
hole

Spiral cage

Ball Float

- B= Nipple length
- D= 90% to top tank
- A= Reference pnt. to ball float tube
- F= Ball float length
- F= B+D-A

Site: _____ City: _____ UST # _____

New Hampshire Department of Environmental Services (NHDES)

Field Verification

BALL FLOAT VENT VALVES

90% flow restriction device

The Ball Float Pipe must be equal to or be longer than the calculated (F) below.

A= Distance from a reference point to the top end of the ball float pipe.

B= Distance from the reference point to the inside top of tank.

D= Distance, 10% of total tank capacity (NHDES requirement) to be determined from appropriate tank chart.

F= Minimum length of Ball Float Pipe.

Ball Float in a tank manway requires additional length (4"+).

Check vent orifice (bleed hole), 1/8" must be open and located near top of tank +.

Check the ball for holes, cracks and movement.

Tank: _____, Size _____

$B + D - A = F$

$B + D - A = F$ (min. required)

What is currently installed (F) = _____

Circle: Ball Float **PASS** or **FAIL**

Ball Float replaced **YES** or **NO**

Tank: _____, Size _____

$B + D - A = F$

$B + D - A = F$ (min. required)

What is currently installed (F) = _____

Circle: Ball Float **PASS** or **FAIL**

Ball Float replaced **YES** or **NO**

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$B + D - A = F$ (min. required)

What is currently installed (F) = _____

Circle: Ball Float **PASS** or **FAIL**

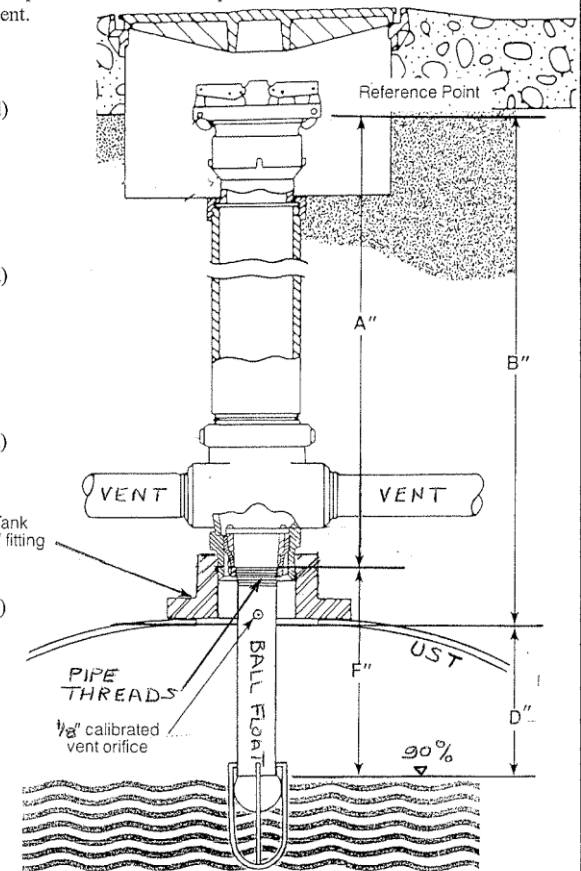
Ball Float replaced **YES** or **NO**

Inspector: _____

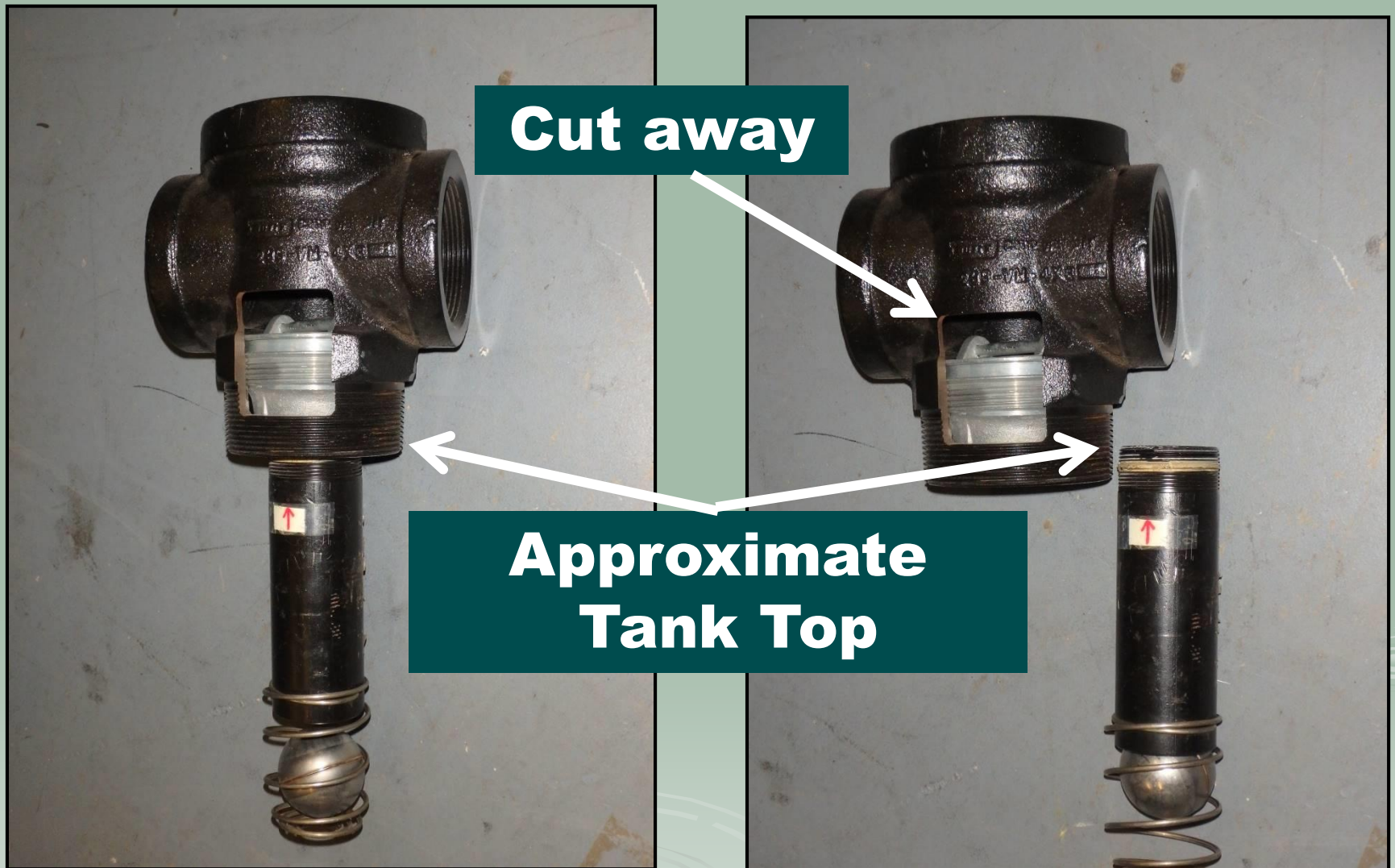
Company: _____

Date: _____

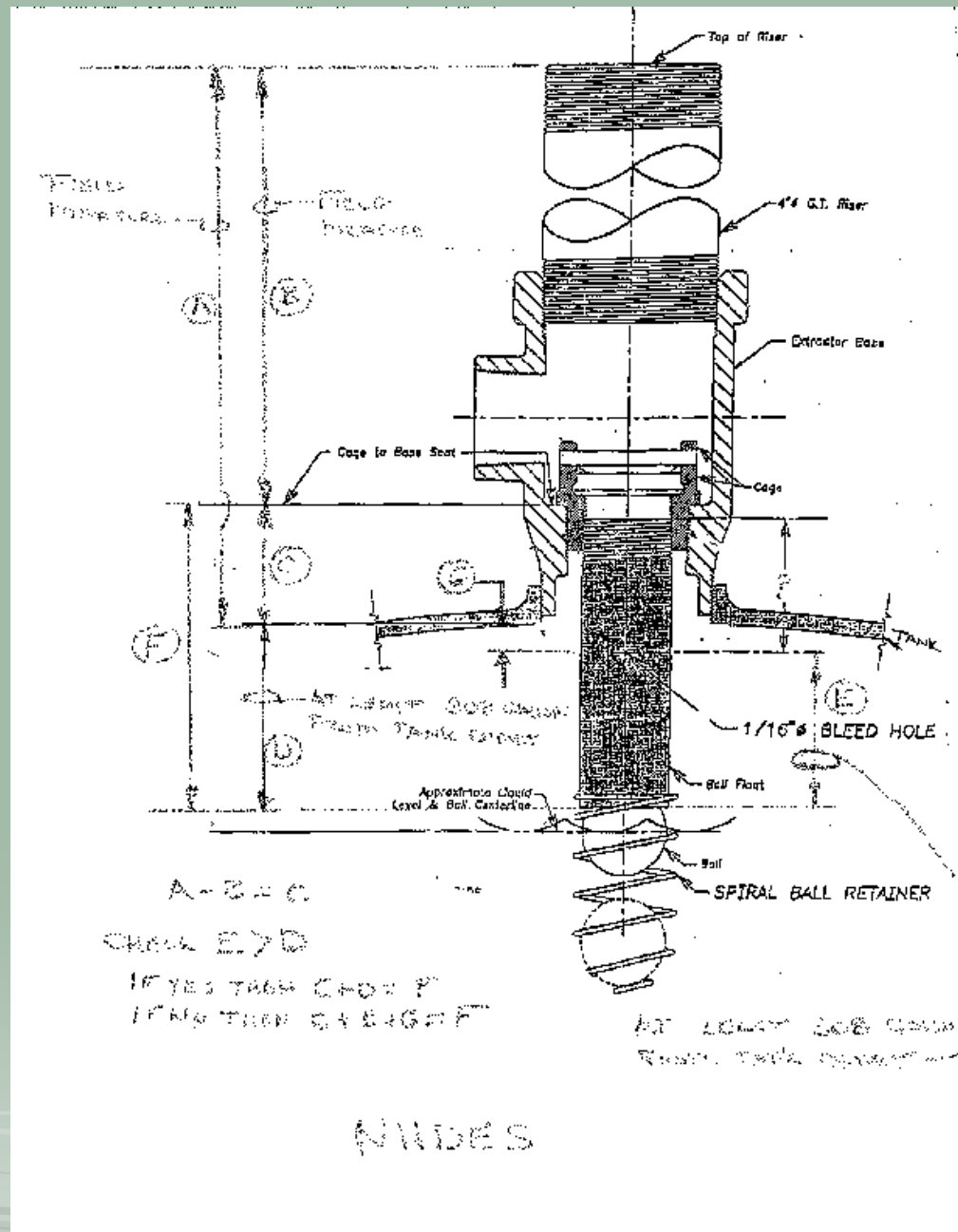
H:\shce\lock\ballfloatmeasurement.doc 2/12/04



Inside Tank Top



30 Min. Ball Float Complicated



EMCO

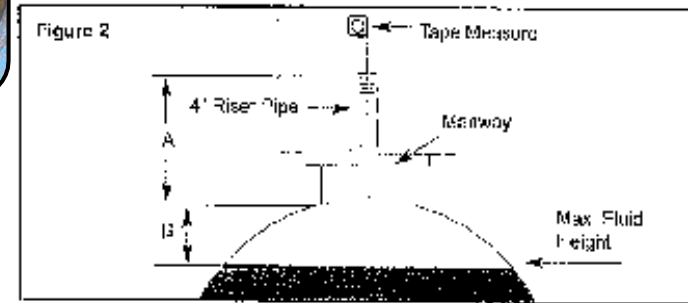
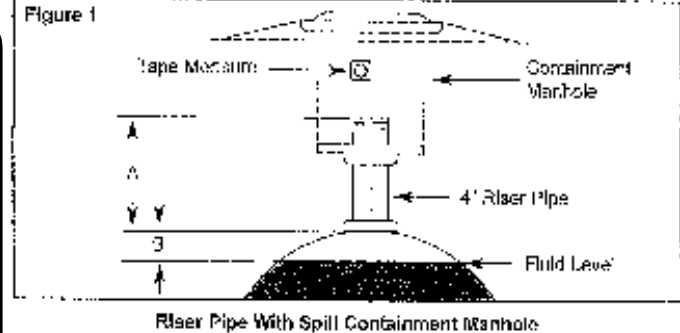
C= Top tube length

A= Nipple length

B= 95% Fill level to top



EMCO A100 GUARDIAN



Step 2: Find Measurement B from the chart below. It is the distance from the maximum fluid height allowed in the inside top of the tank. Calculations are for cylindrical tanks with flat ends. For exact dimensions, consult the chart provided with your tank. Local requirements may limit fill capacity to 97%.

Tank Diameter	95% Shut-off B Dimension	97% Shut-off B Dimension
Feet Meters	inches MM	inches MM
6.5'	1.68	1.90
7.0'	2.13	2.47
7.6'	2.25	2.57
8.0'	2.44	2.78
8.2'	2.50	2.84
8.6'	2.53	2.87
9.0'	2.74	2.98
9.5'	2.80	3.05
10.0'	3.05	3.38
12.0'	3.60	4.11

The A100 Overfill Prevention Valve is not recommended for tanks under 6.5' (1.98 m) in diameter.

(C) TOP TUBE = A + B - 3"

C = A + B + manway - 3"

EBW

Old EBW

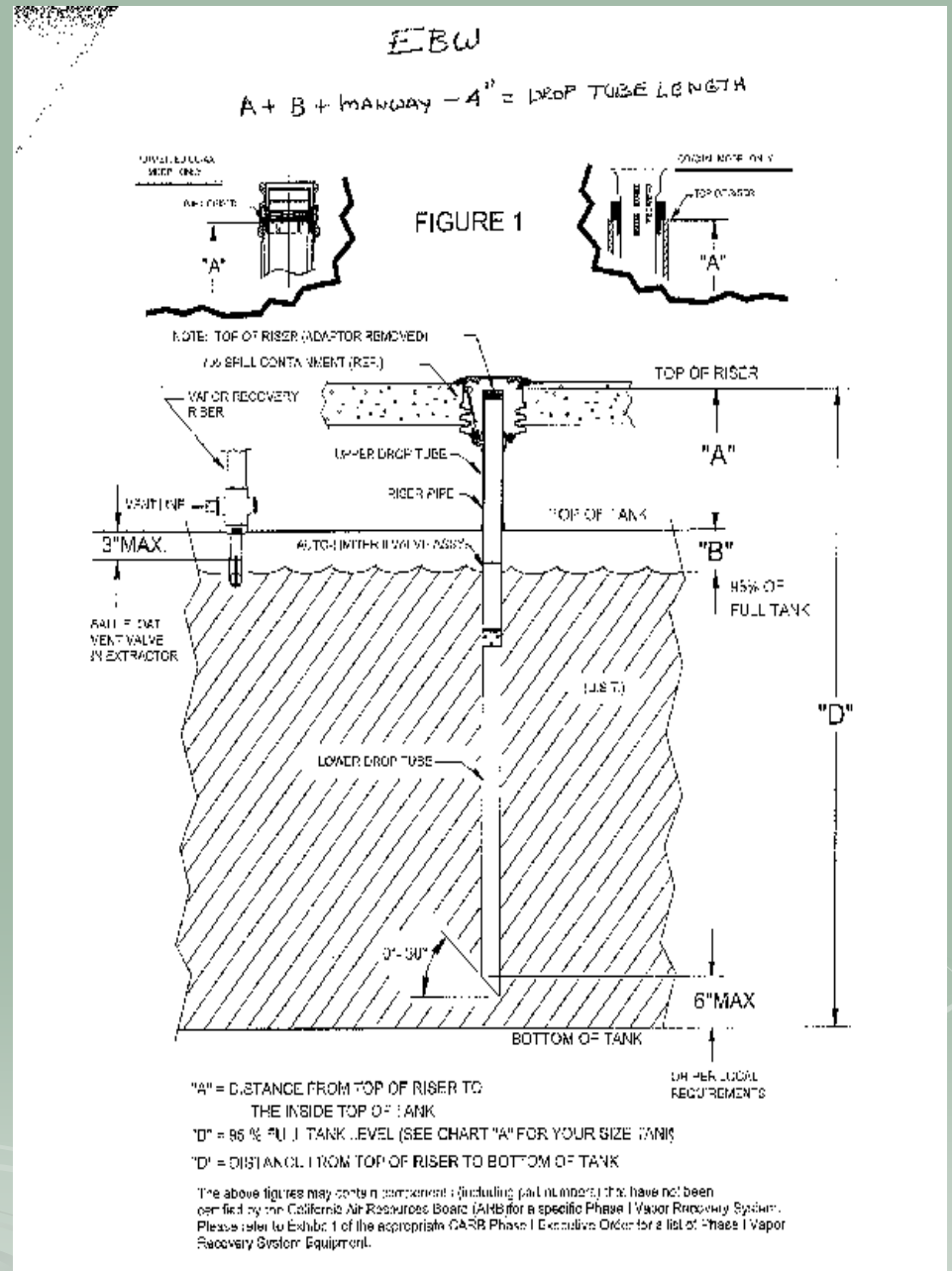
Without the 95% mark

C = Top tube length

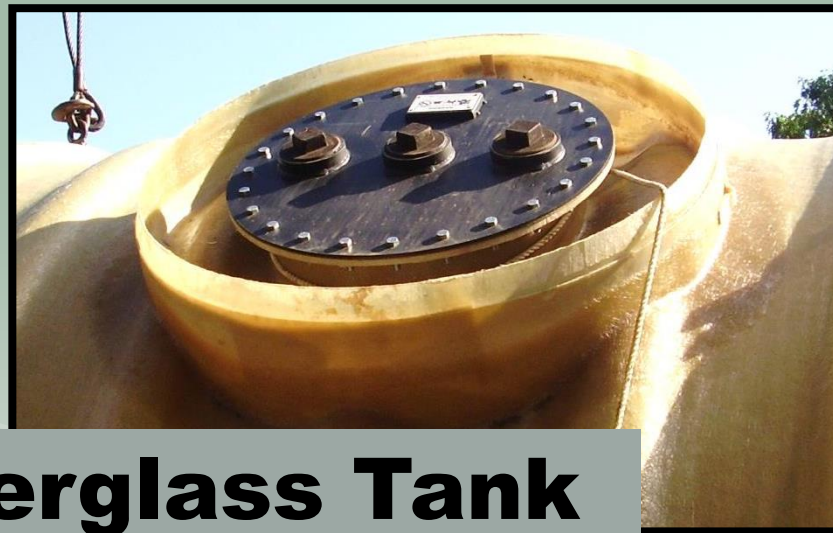
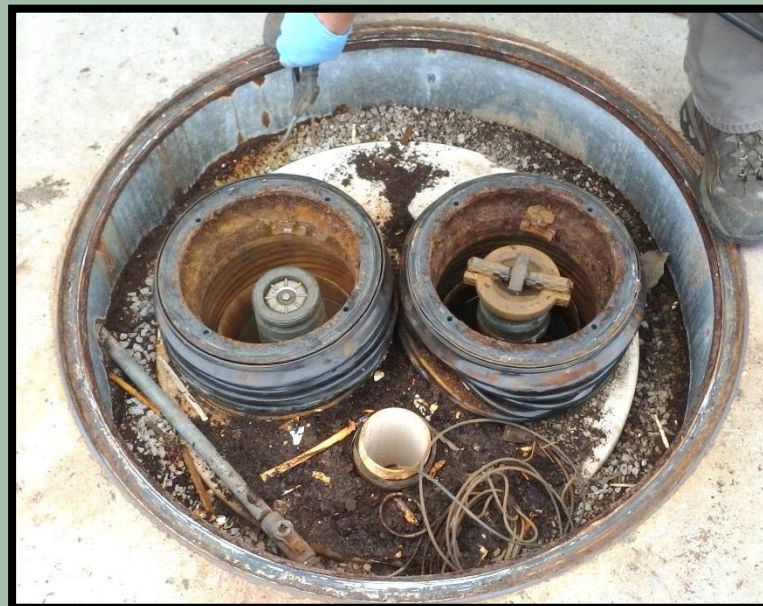
A = Nipple length

B = 95% Fill level to top

C = A + B + manway - 4"



Tanks with Manway



Fiberglass Tank

OPW

- Verify valve closes when lifting float
- Check resistance of float (will it float?)
- Still waiting for a requested -

Spruce Spring Scale
to measure acceptable
hinge resistance (Ha)
(currently just estimate)

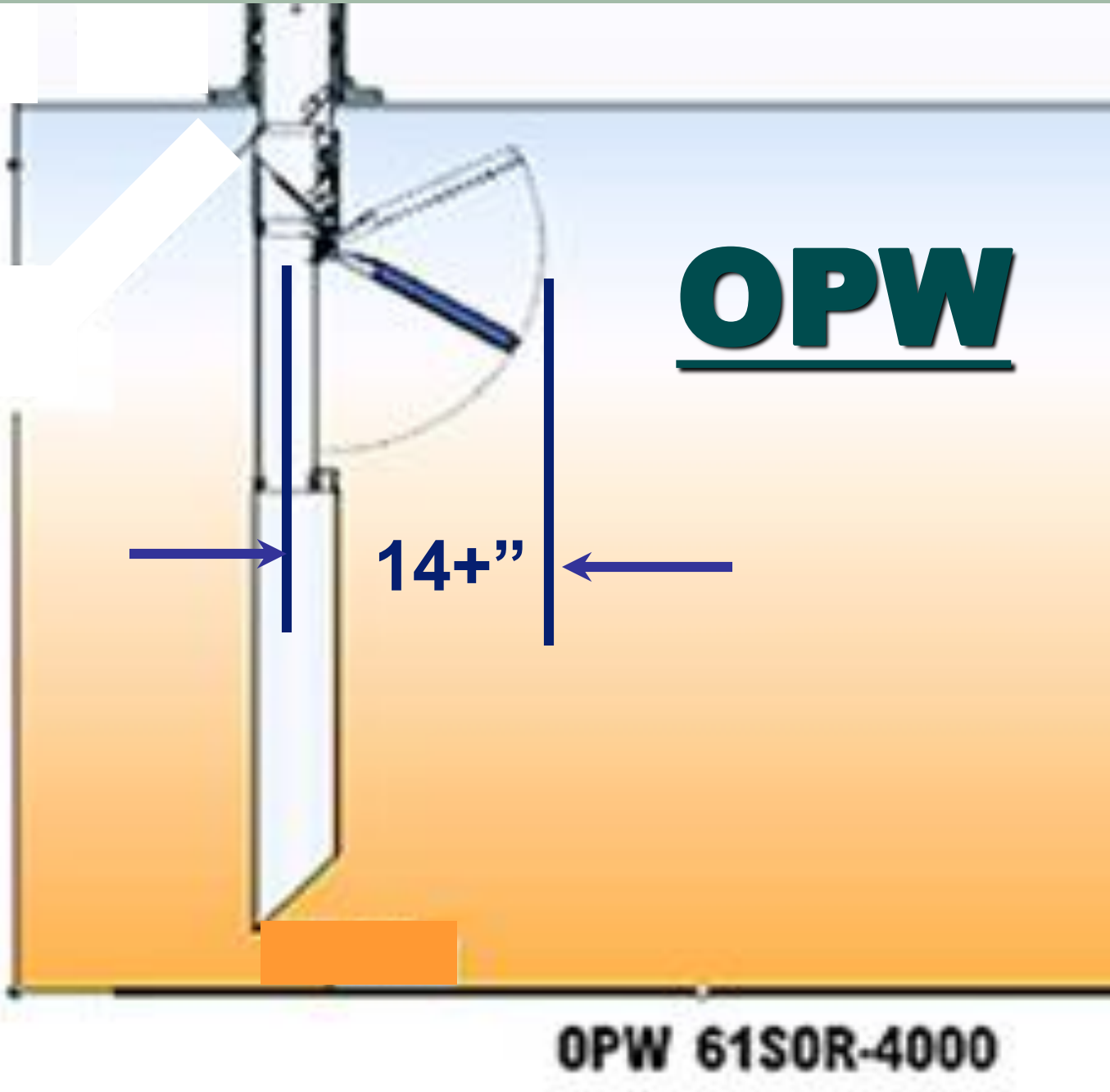
Float
Should
pop
out like
this

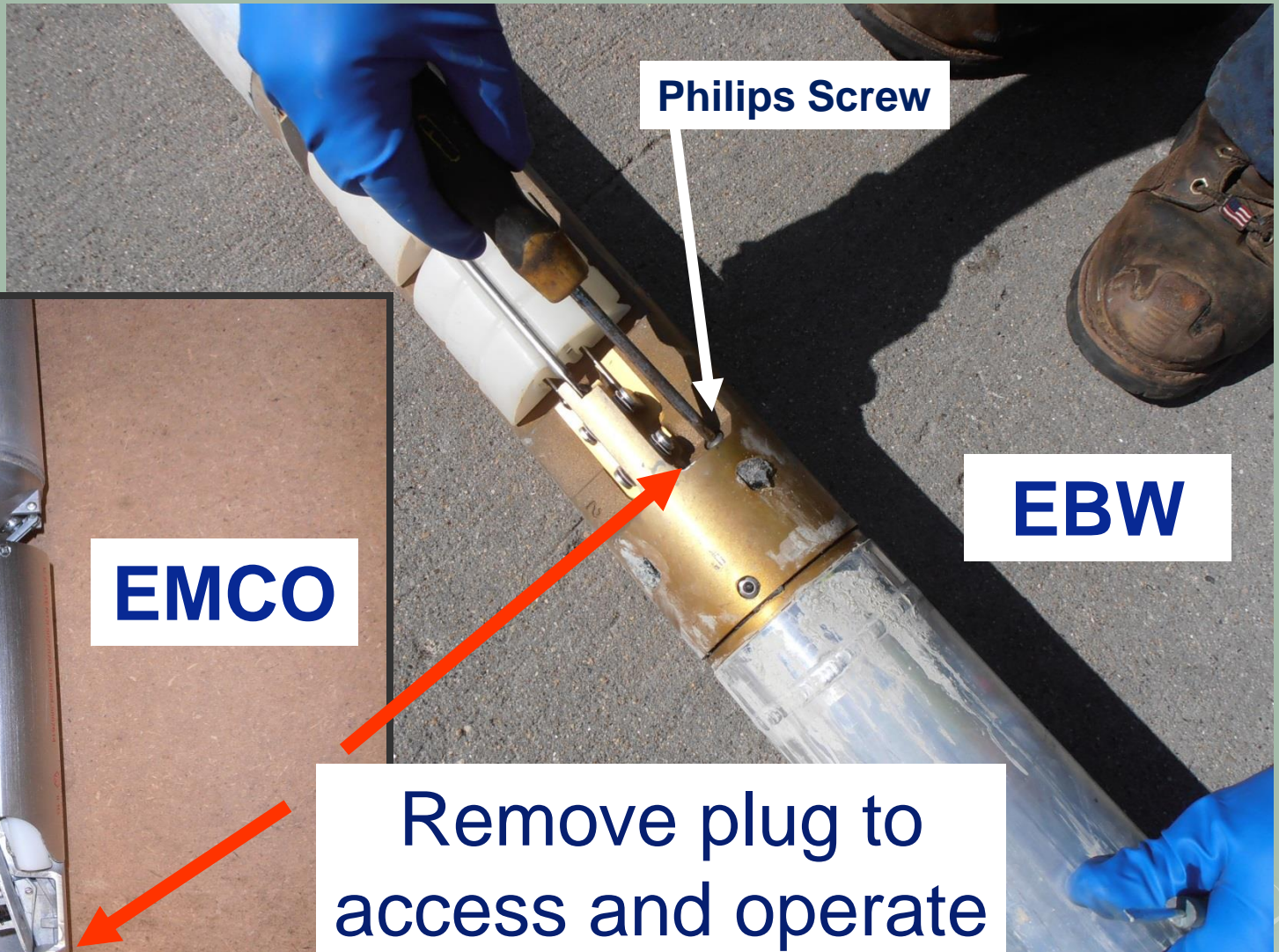


OPW

14+”

OPW 61S0R-4000



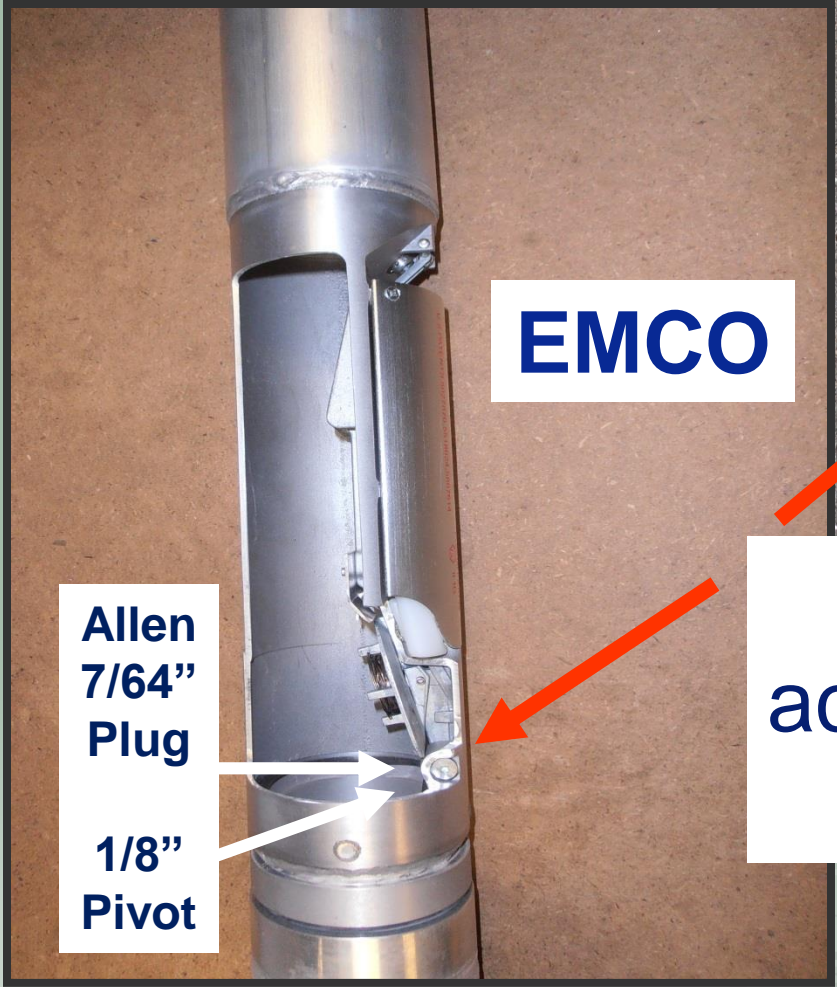


Philips Screw

EBW

EMCO

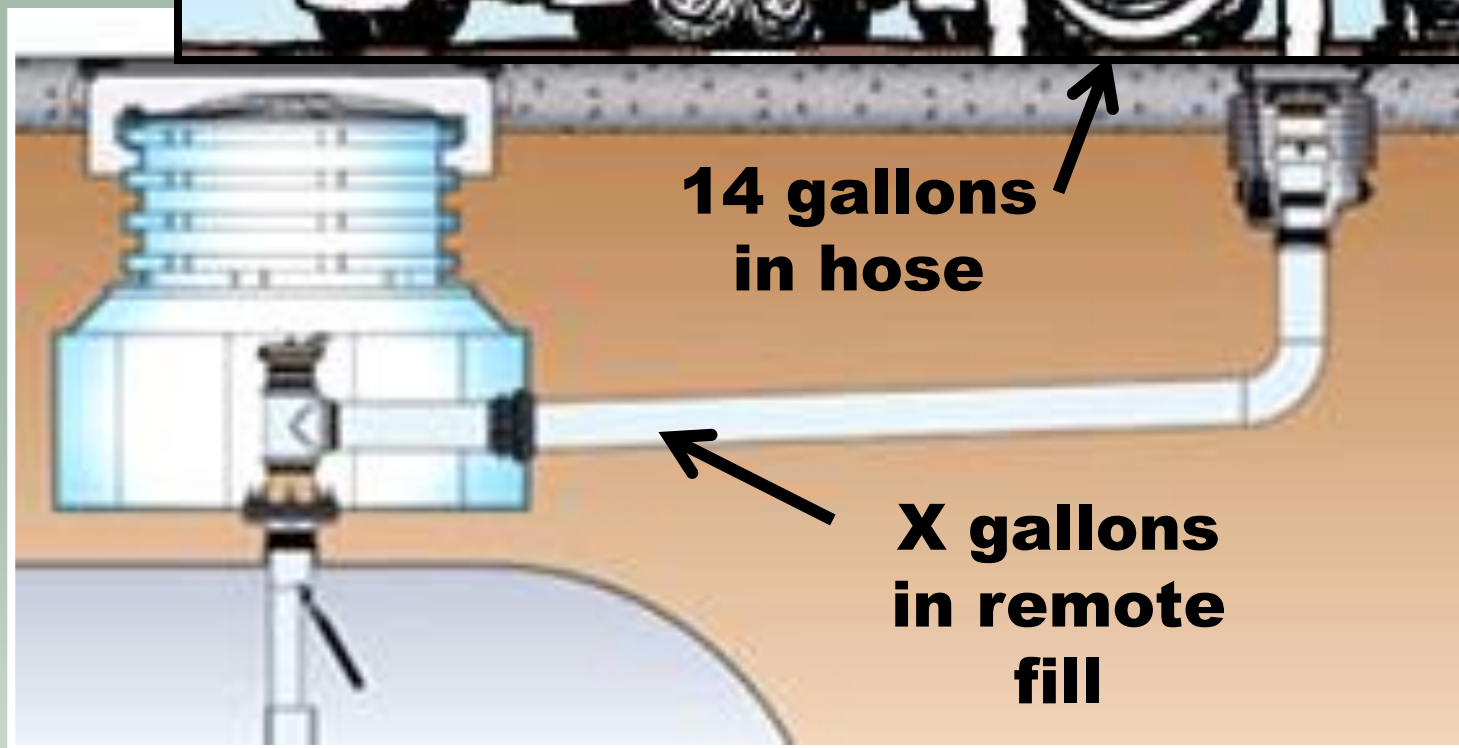
Remove plug to access and operate flapper valve



Allen 7/64" Plug

1/8" Pivot

Remote fill
consider
pipng
liquid
volume



Tanks Installed Different Elevations



**Siphon
Bar/Line**

Tank #1

Tank #2

**Product level
after delivery**

Problems with Tanks at Different Elevations

- When installing tank top upgrades
- When changing products
- When systems are tied together

- Rule writing;
 - Require posting overflow setting on site?
 - For future overflow replacement

Drop Tube OF

- OPW 61TNG-4000
 - Vacuum operated



Questions



Top Section



Problems



Top Section

Why



Top Section

Not NH



Hinge problem



Should look like

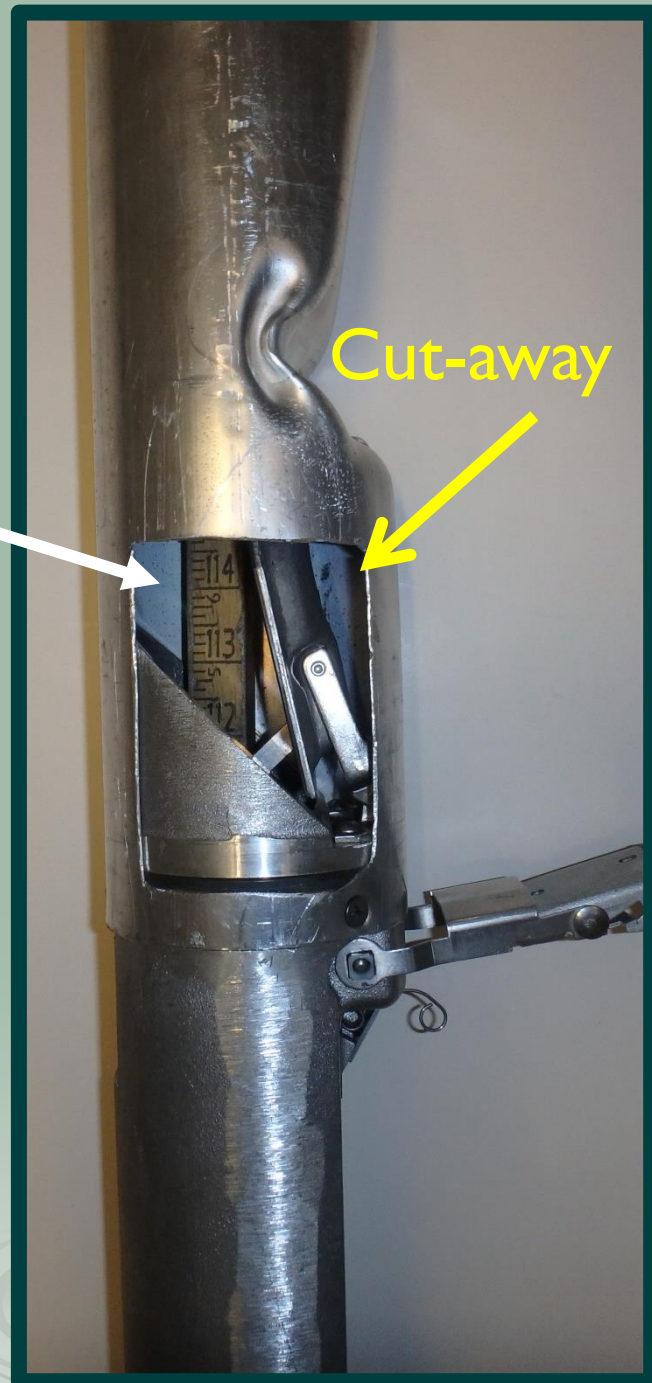
Compromised Overfill



What NOT to do



**Delivery with
flapper valve**



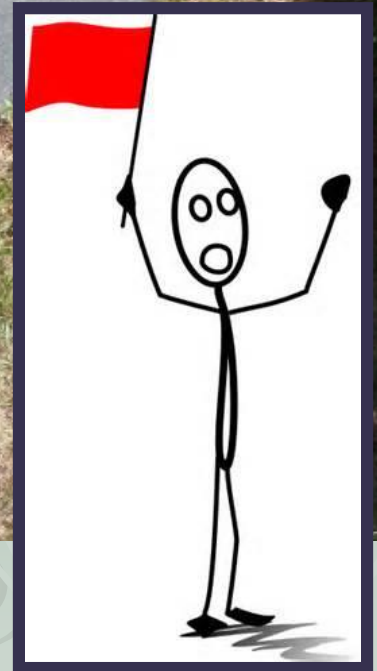
**Inside fill
drop tube**



What is this?



Short or broken inventory sticks



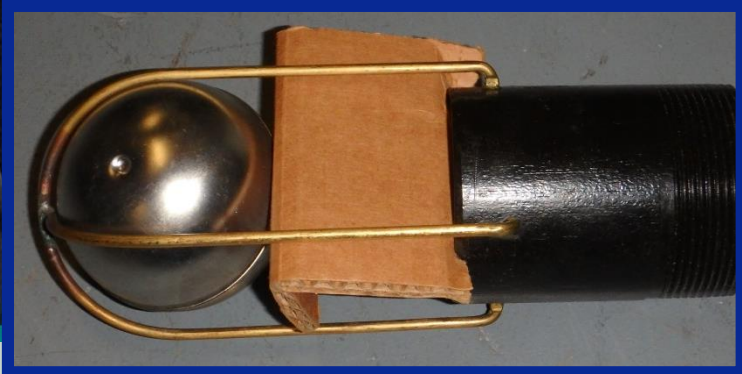
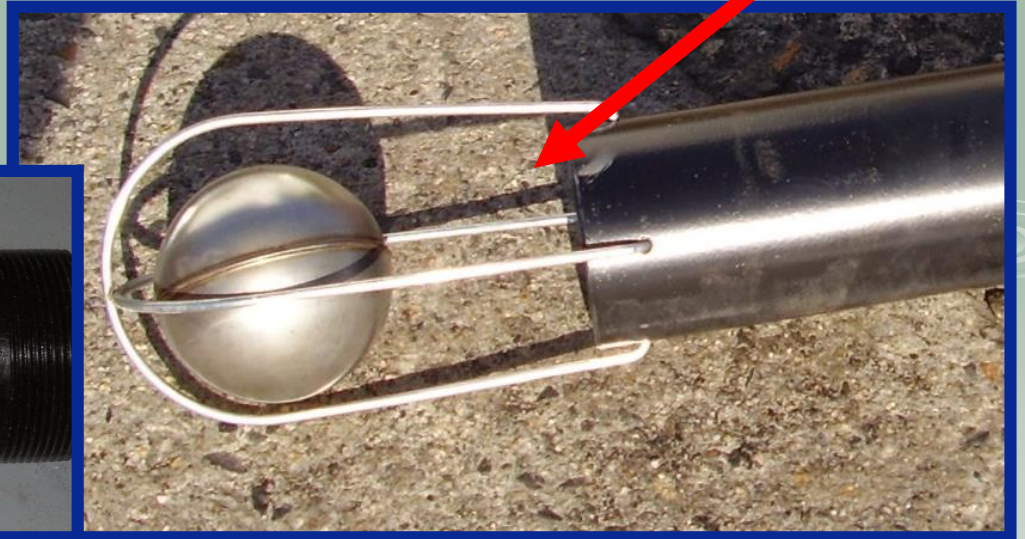
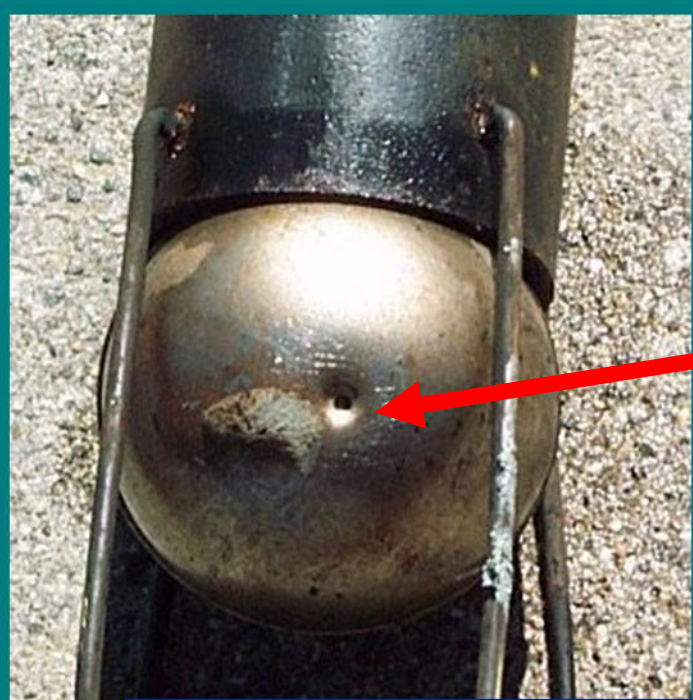
Bad Signs



Short & Stuck



Bad Signs



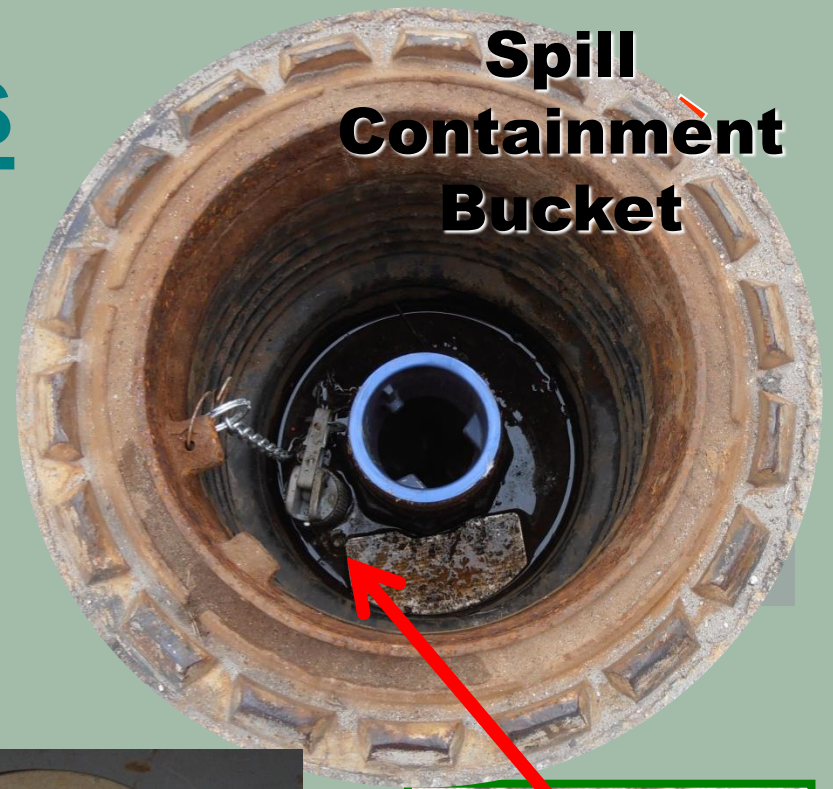
Hold the ball from floating

- **Debris on top of the ball;**
 - **Broken caps/cover**
 - **Broken dry break adapter**
 - **Gaskets**
 - **Pipe dope**
 - **Rusty metal**
 - **Tools**
 - **Sunglasses**

Problems



Zip Tie



**Spill
Containment
Bucket**



Loose ATG Cap



Leaking Drain Valve

Delivery truck full of product creates pressure

(vertical feet to ball float is more than 11 feet)

Note: 11.5 feet = 5 psi

(Can over pressurize tank) pop caps loose, even split a tank



Blow out rust plug



Diesel Tanks



**Bleed hole
corroded**

**6 yrs. Old
in
Fiberglass
Tank**

**Cage
corroded**



When Whistler
Tone Ceases,
Stop Fuel
Delivery
Immediately
Do Not Leave Unattended

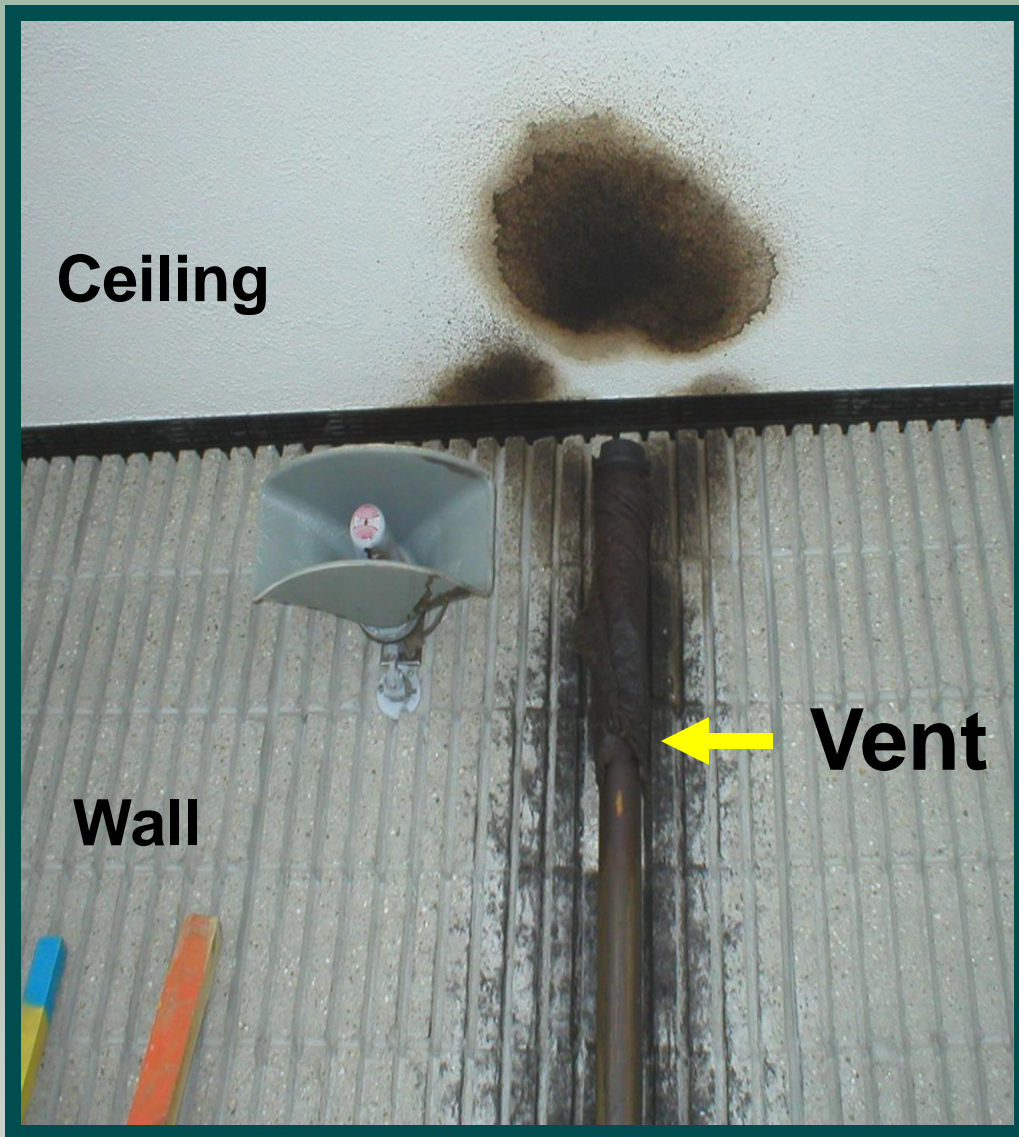


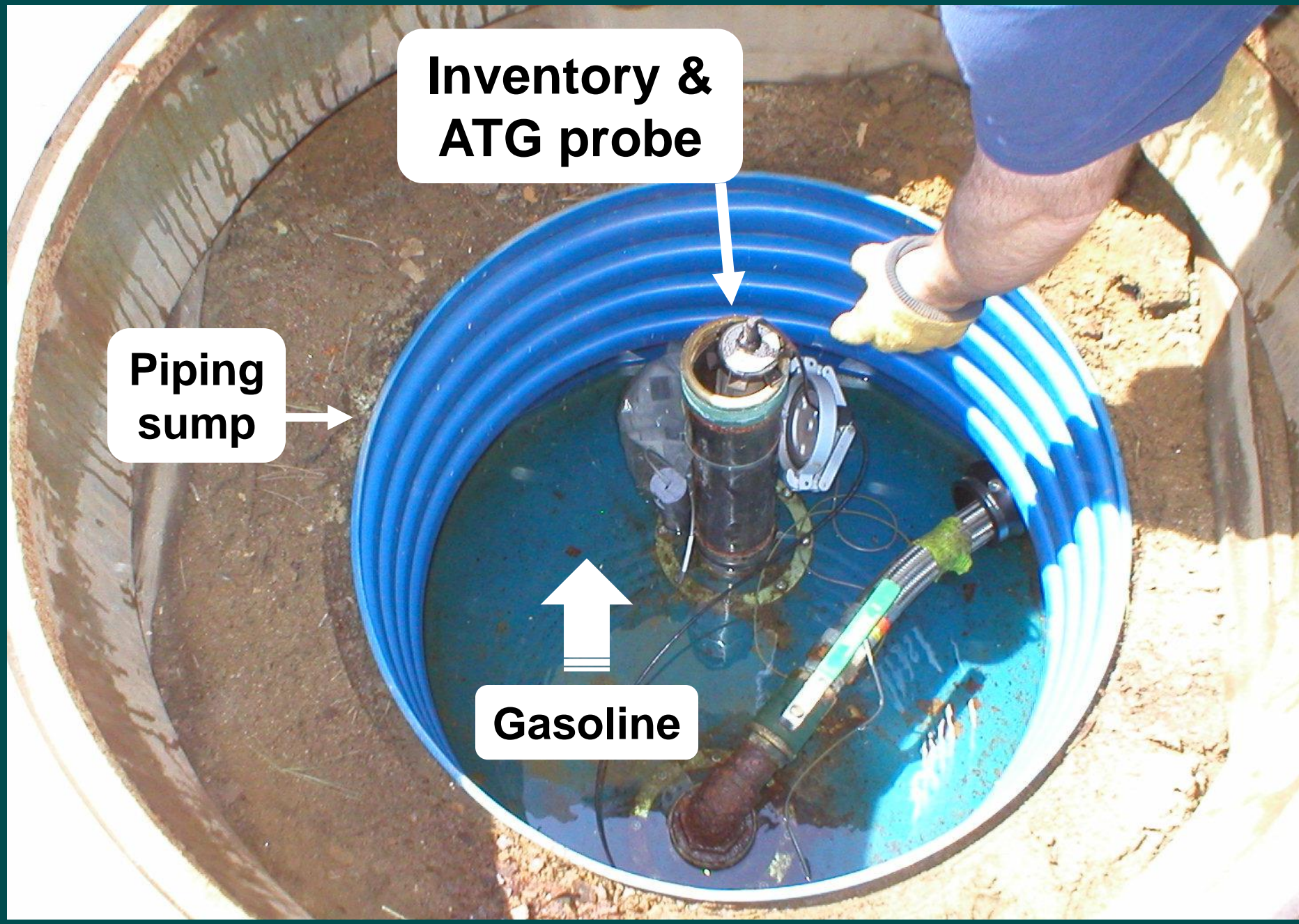
STOP
DELIVER
WHEN ALARM
SOUNDS



**In the
Basement**

Overfilling - Vents





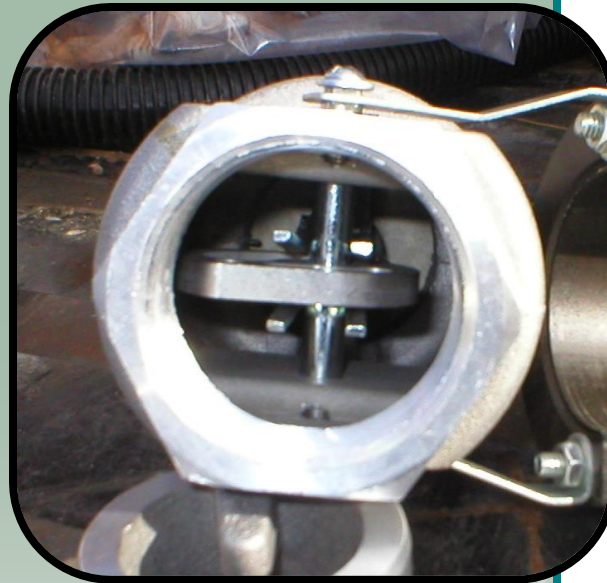
**Inventory &
ATG probe**

**Piping
sump**

Gasoline

Above Ground Tank Device

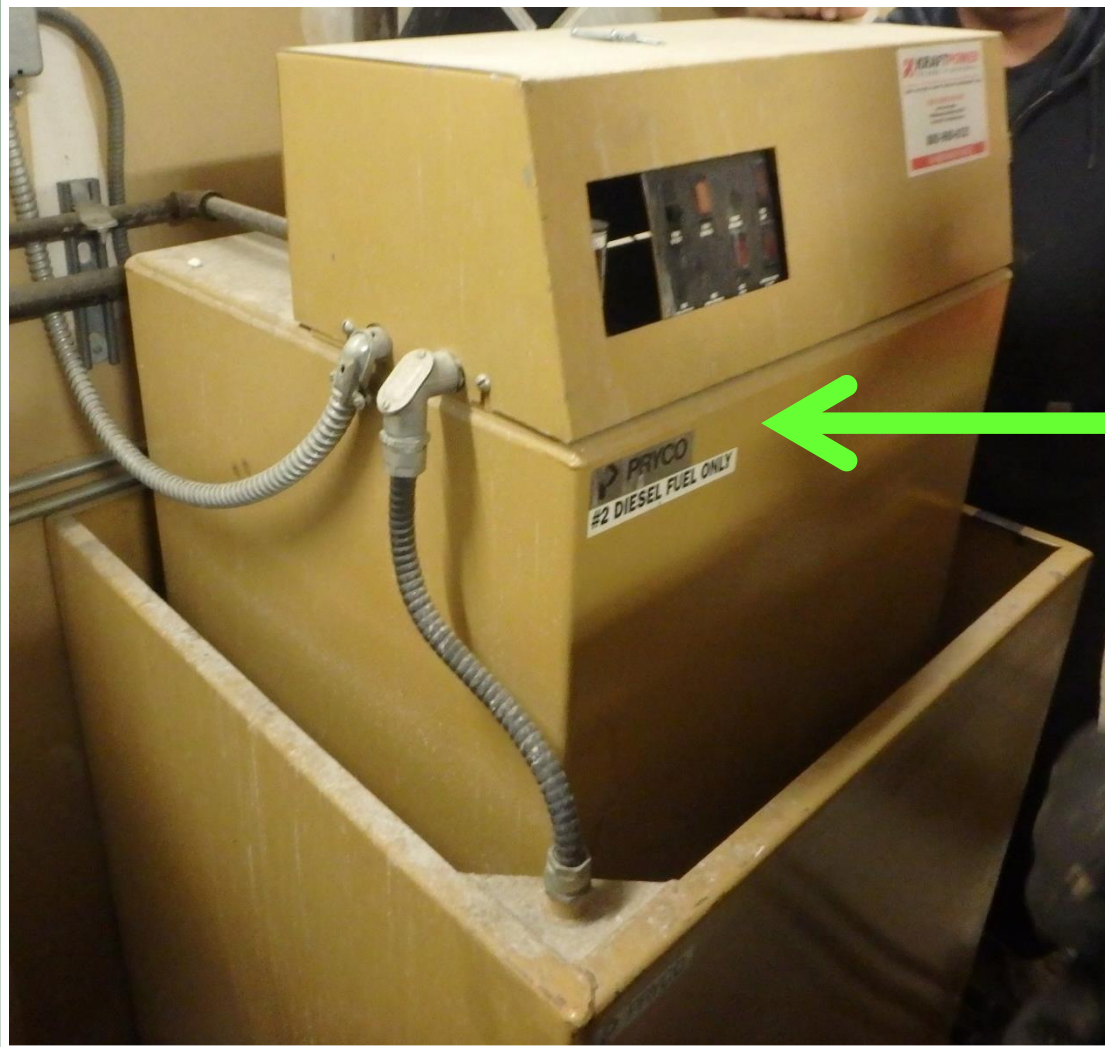
- OPW 61FSTOP
 - NH Approved per waiver request
 - ** 90% fill level
 - Pressure delivery
 - heating oil
 - kerosene
 - diesel
 - **Can not stick tank!**



Day Tank

NH Overfill Sensor Testing

NFPA code – National Fire Protection Association



Rule Writing Considerations

- Register primary overflow
- Plan review for product change
- Alarm Signage
- Lumens & alarm times (driver accessible)
- 95% complete shutoff & restrictive devices
- Day tanks
- Testing requirements (upon-removal)
- Pressure delivery remove ball float/flapper

NH Rules

<https://www.des.nh.gov/organization/commissioner/legal/rules/documents/env-or400.pdf>

Summary #1

- Operation
- How to manually inspect
- Conditions and issues
- NH 1 in 4 inspections have overfill issues
 - That could not be resolved during inspection
- **If O/F devices are not removed and inspected (Proper Install & Operation is??)**



Questions-??



?????



Tools



Adapter Tools



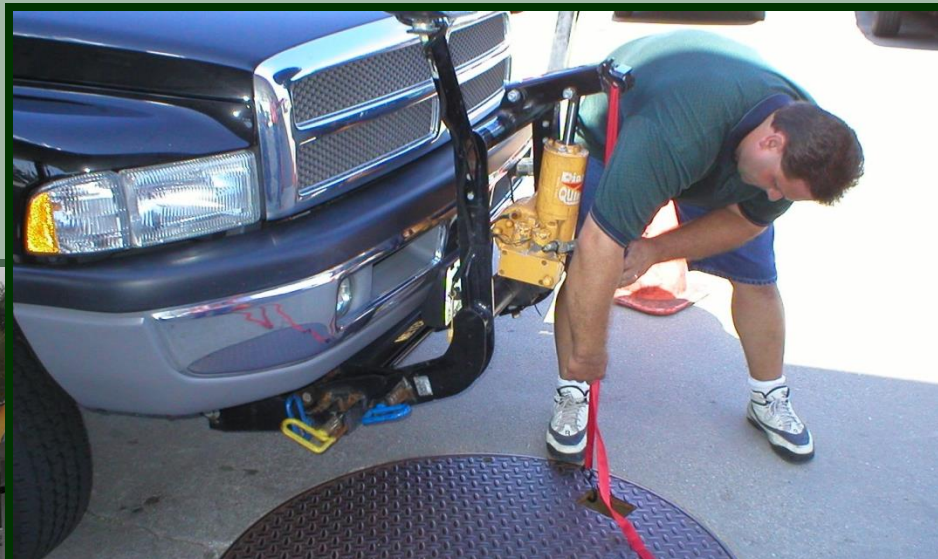
Drop Tube Removal



Ball Float Access



Access



Vault

Contact Information

Spruce C. Wheelock

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(603) 271-0673



Final Questions



**I have
one**