Motor Fuel Dispensing Facilities & Underground Storage Tanks

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Office of the State Fire Marshal

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Presentation Agenda

- Legal Foundations of the State UST Program
- What is a UST?
- Types of Dispensing Facilities
- Systems/Equipment checked for each
- UST Safety Components
- Other UST Inspection Activities
  - New Installations
  - Decommissioning of USTs
- Conclusion

Foundations of OSFM UST Regulations

- Federal Laws (EPA established in 1970)
  - Federal EPA Acts (USTs start with RCRA in 1976)
  - Federal EPA Regulations: 40 CFR Part 280
  - Federal EPA Guidelines as issued
- Illinois Laws (State program established in 1987)
  - "The Gasoline Storage Act" -- Chapter 430 (Public Safety) ILCS 15 (Statute)
  - Title 41 IAC Parts 174, 175, 176 & 177 (Regulation)
  - Associated Policies & Interpretations
- OSFM HAS SOLE AUTHORITY & JURISDICTION OVER UST REGULATION IN ILLINOIS BY STATUTE

UST Definition from 41 IAC 174.100

"Underground Storage Tank System" or "UST" means any one or combination of tanks (including connected underground pipes, connected ancillary equipment and connected cathodic protection) used to contain an accumulation of regulated substances, the volume of which (including the volume of underground connected pipes) is 10 percent or more beneath the surface of the ground. (41 IAC 174.100)

What is NOT a UST?

- Farms/Residences (1 & 2 family)
  - Heating Oil Tanks of any size
  - Fuel Storage Tanks of 1,100 gallons or less used for non-commercial purposes
- Pipelines
- Waste Water Treatment Plants
- Septic Tanks
- Tanks with capacity of 110 gallons or less
- Tanks in basements viewable from all 6 sides

Nice UST

Not So Nice UST

So What Is a UST?

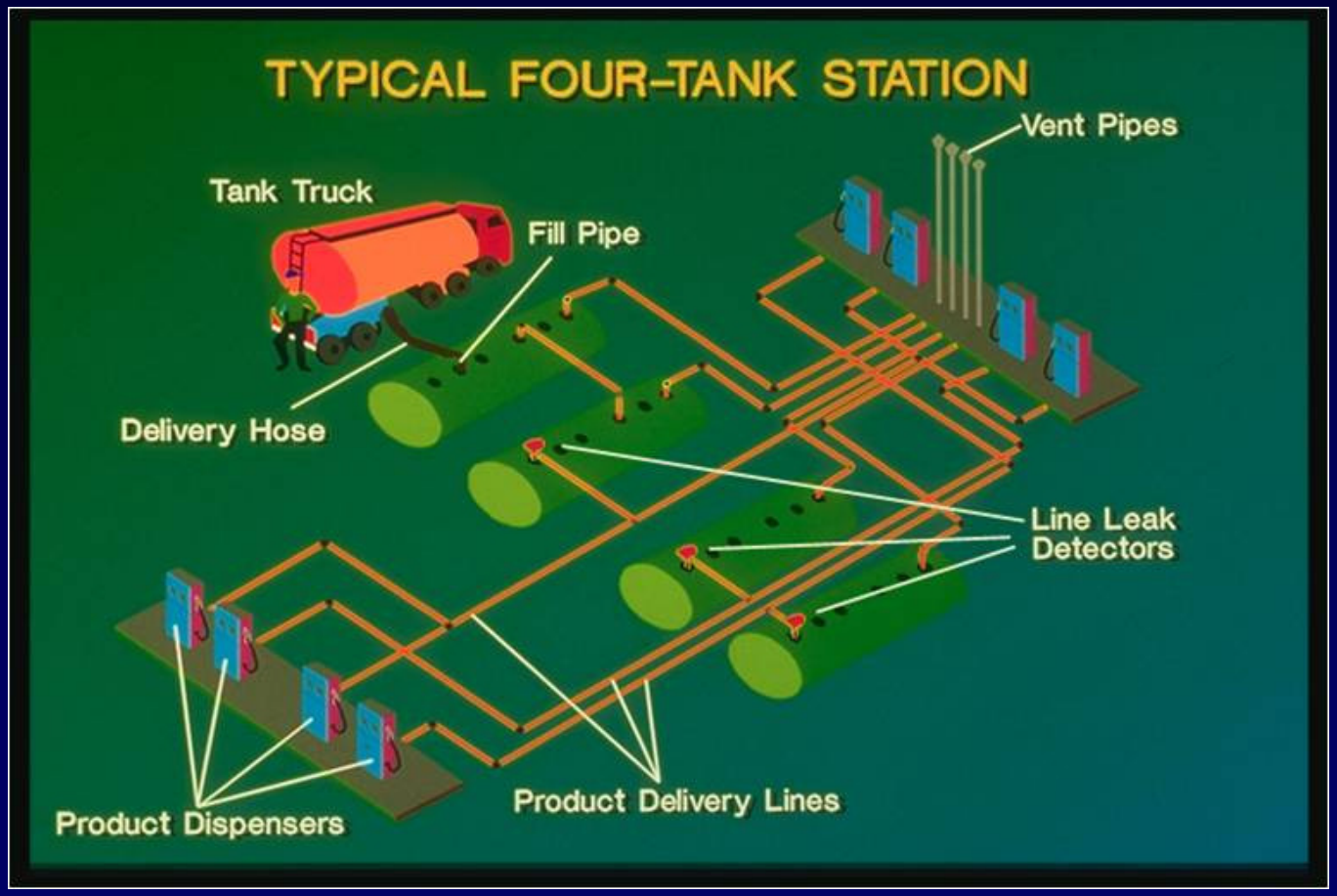
- It is a system comprised of:
  - The regulated, registered tank or tanks holding product, usually fuel
  - The pumps that either push the fuel out under pressure or pull it up under suction
  - The piping that the fuel moves through
  - The various sumps or containments for leaks/spills
  - The monitoring/detecting equipment to prevent or signal spills/overfills/releases of product
  - Transitional components located where the piping comes into the dispenser or changes direction

What is Not part of a UST System?

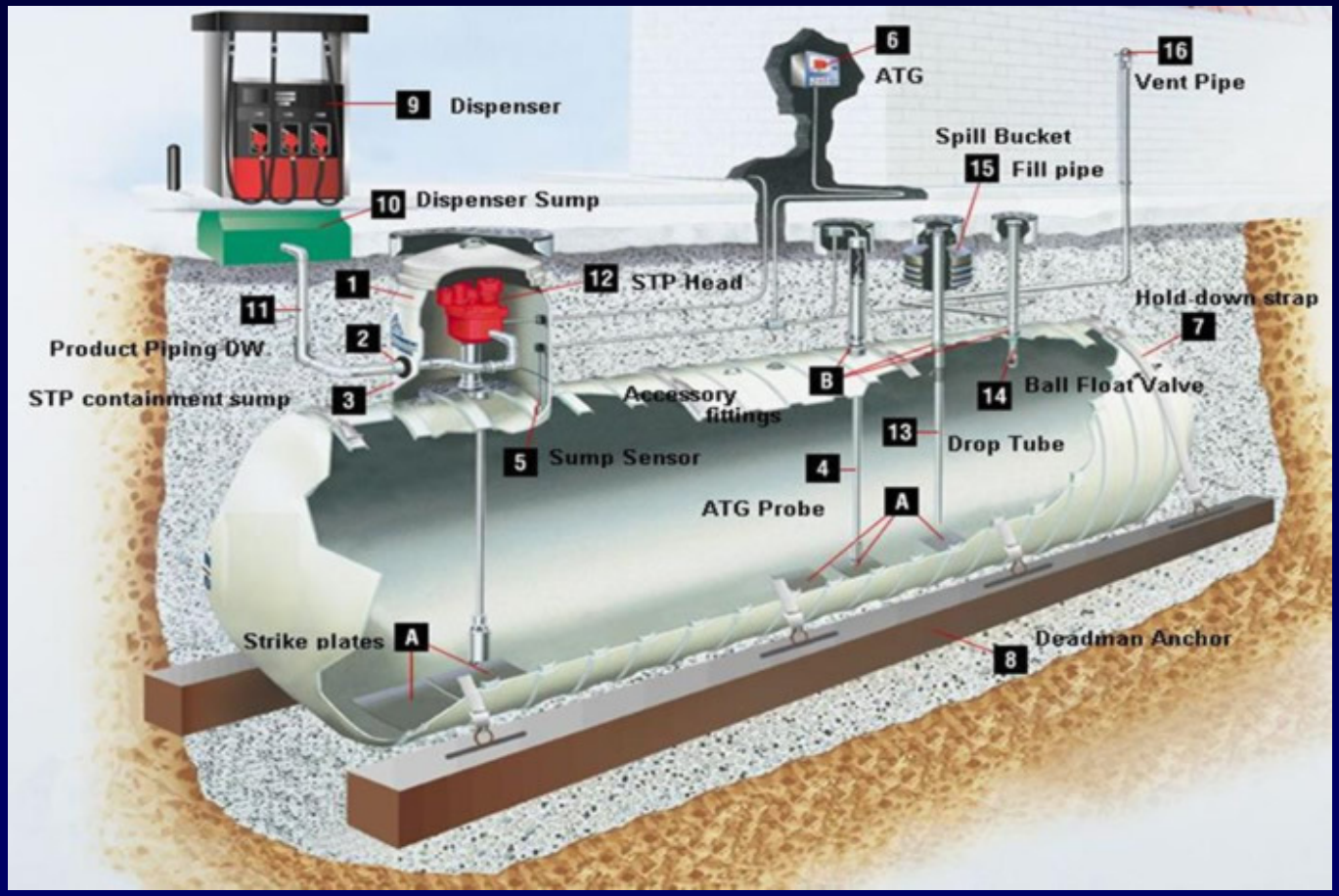
- Dispensers, hoses, nozzles
- Stage II Vapor Recovery Systems
- The Convenience Store
- Any Aboveground Tanks

The first 2 we inspect anyway, but we do not regulate the 2nd. We do not regulate or inspect the store. ASTs are under the OSFM Fire Prevention Division's jurisdiction, and P&CS does not inspect them either. Any aboveground piping associated with an underground tank is part of a UST, though

Tanks & Piping System for Dispensing



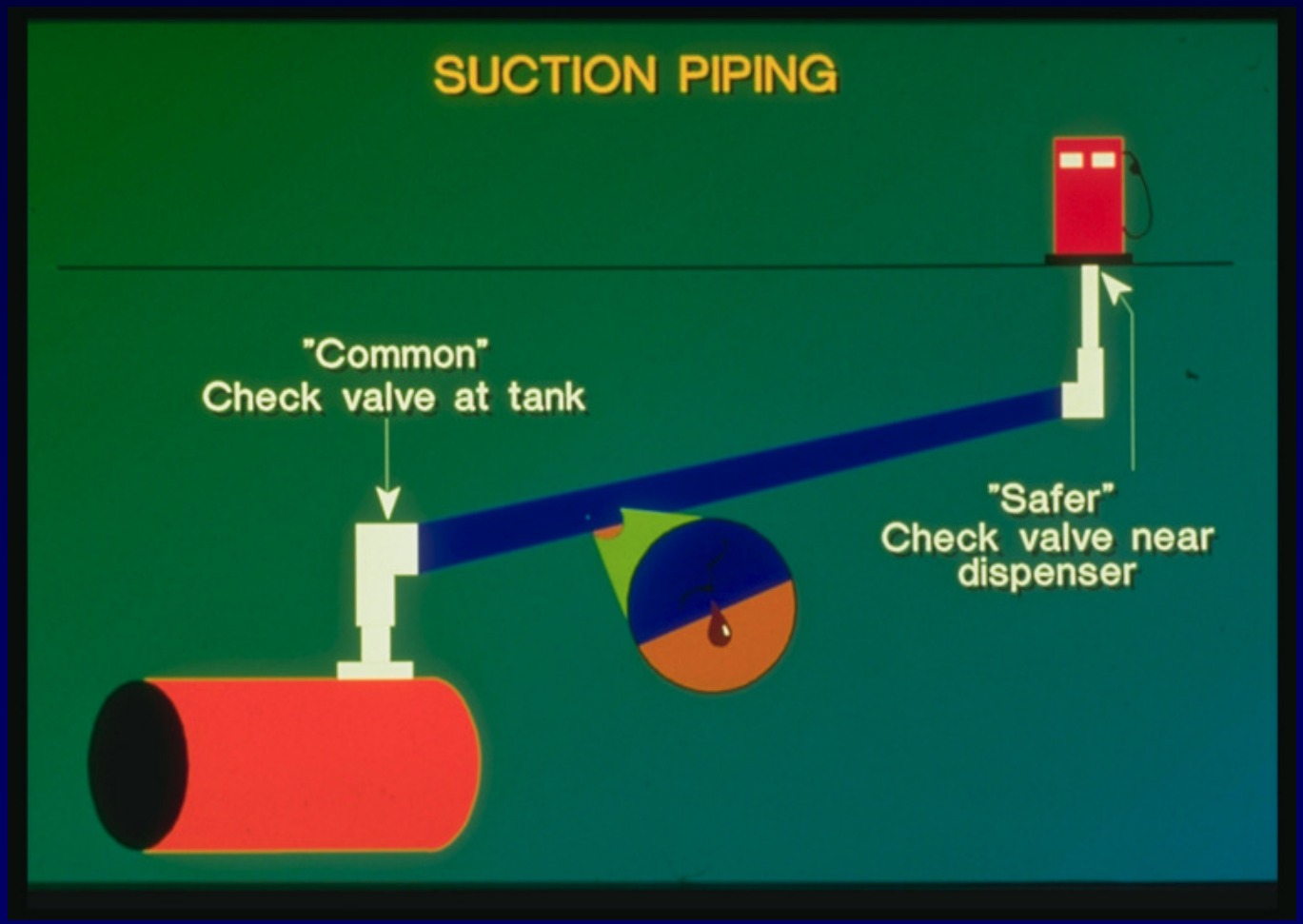
Common Pressurized Piping System with Submersible Turbine Pump



The Other Type of Piping System: Suction Piping

- Two kinds of Suction Piping
  - Safe or European Suction
    - One check valve, at or near the dispenser or equipment being supplied
    - Loss of suction will result in product flowing back into the tank by gravity
  - Common or American Suction
    - More than one check valve in the piping system
    - Product can be held in the piping without freely flowing back to the tank

Less Commonly Used Suction System showing "Safe" & "Common" Check Valves



Suction vs. Pressurized Piping

- Safe suction often used with generator USTs
- Might be found with dispensers where the piping & product throughput is minimal – the dispenser might be placed directly above the UST
- Suction is not practical if distance, branching, 90s or other friction-causing elements are present in the piping system
- Most retail dispensing operations use pressurized piping systems

This is What You Will Actually See at a Typical Retail Dispensing Site

Step 1: Open the Sump Lids

These Are a Couple of the Things in There: Fill Pipe Riser on Left; ATG Sensor on Right

STP in a Clean/Dry Sump on Left; Interstitial Sensor on Right

Corrosion and Some Product in Sump

Corrosion and Contaminated Water in Sump

5 Types of Dispensing Operations

1. What you will see most often we call “Attended Self-Service Motor Fuel Dispensing Facilities”
2. There are also “Unattended S-S MFDFs”
   – These can be the same place at different times of day
3. Fleet Vehicle MFDFs
4. Full Service MFDFs
5. Marina MFDFs, which are Full Service by regulation

Typical Attended Self-Service Dispensing Facility: 41 IAC 175.210

What you will probably find:

- Islands with Dispensers under a Canopy
  - At least 2 grades of E-10 unleaded gasoline, but often 3: Regular/Midgrade/Premium
  - Possibly Diesel with separate hose at the same dispenser
  - Possibly E-85: may be at separate dispenser
  - Possibly Kerosene at a separate dispenser
- Convenience Store, Car Wash
- Possibly Propane tanks -- & Firewood??!!

Attended Self-Service Truckstop Diesel Islands

Usually you will find a “Master” on one side and a “Slave” on the other

Retail Unattended Self-Service: 175.220

- Open to the public
- Might be a station that is attended during part of the 24 hours: Access to fuel with key, card, cash
- Many more requirements than ASS:
  - More information on signs
  - Either a Fire Suppression System installed **or**
  - A Fire Detection System with Extinguishers
- Alarm must transmit to local FD automatically
- With either option, activation of system also activates an Emergency Stop Switch for pumps

Fleet Vehicle Dispensing (Unattended Dispensing not open to Public): 175.230

Fleet Site with Diesel & Gas Dispensers

Full-Service (yes, it's Attended, & there are still a few left): 175.240

Marina Dispensing, also a Full-Service Facility: 175.250

Manned or Unmanned vs. Attended or Unattended

- Fuel Dispensing Facilities which have attendants supervising the dispensing of fuel are **Attended** facilities; they are also now referred to as **Manned**.

- Fuel Dispensing Facilities which do not have attendants supervising the dispensing of fuel are **Unattended Facilities**; they are also **Unmanned**.

- There are USTs which do not dispense fuel – they supply it to equipment. There are no attendants, but there is also no fuel being dispensed. These facilities are **Unmanned**, but <u>not</u> **Unattended**. Clear?

Standard Safety Devices Found at all Dispensing Facility USTs

- The Emergency Stop Switch (E-Stop)
- The Breakaway Coupling
- Bollards & Curbs
- The Shear/ Crash/ Fire Valve
- Overfill Prevention Devices
  - Ball Float Valve & Flapper Valve
- Overfill Alarm
- The Automatic Tank Gauge (ATG)
- Portable Fire Extinguishers

Emergency Stop Switches (E-Stops)

Might look like this….

But this is better….

Common E-Stop Problem…

Breakaway Coupling for Dispensing Hose

In case you didn't know why the breakaways are needed….

Bollards & Curbs…

- Required to protect Dispensers and LP Tank Cabinets
- Bollards may be straight or U-Shaped and must be anchored securely. Usually 3”- 4” pipe filled with concrete
- Curbs need to be at least 5” high
- Guardrails may also be used
- Inspectors typically decide on job site if protection is adequate & tell contractor