

OVERFILL PREVENTION: ELECTRONIC ALARMS

What is a fuel-delivery overfill? In a typical delivery, the tank on the truck is empty before the underground tank is completely full. If the underground tank is completely filled before the tank on the truck is empty, the driver will be stuck with a hose full of fuel. When your UST is full of fuel and the driver's hose is full of fuel that won't fit in the UST, the driver has an overfill situation.

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Courtesy of Marcel Moreau Associates, Portland, Maine.

Fuel Delivery. The driver is preparing to make a fuel delivery. The yellow hose will carry vapors from the underground tank back into the truck. The red hose will carry fuel from the truck into the underground tank. The "elbow" fitting the driver is handling creates a liquid-tight seal with the tank fill pipe. The right end of the red hose will be connected to the valve fittings under the truck. Each valve connects to a separate fuel-carrying compartment in the tank truck. The valves have covers over them to prevent drips and keep the valve mechanism clean.

What can the driver do? He has two options: wait for customers to buy enough fuel so the fuel in the hose will fit in the tank, or disconnect the hose and drain its contents into the spill bucket at the fill-pipe manhole, the most expedient option. However, if the spill bucket is not big enough to contain the remaining fuel, or if it is already full of water and/or dirt, then the fuel will spill into the environment, with the potential for soil and water contamination, not to mention a fire.

Fire codes say that delivery drivers should be standing right by their vehicles so they can pay attention to the delivery—not sitting inside the truck or inside a building. But, guess what? UST rules say that it is **YOUR** job to ensure a representative of the owner, operator, or oil transporter is physically present during fuel deliveries and monitoring all product deliveries or transfers in order to prevent overfills.

WHAT IS YOUR JOB IN PREVENTING DELIVERY OVERFILLS?

As the person who is legally responsible for ensuring that overfills do not happen during fuel deliveries at your UST facility, it is useful to have a written delivery procedure that you follow faithfully. This procedure should include the following measures:

- **Ensure there is enough room in the tank BEFORE each delivery.** Measure the fuel level in your tank(s) BEFORE each delivery. Know the “working” capacity of your tank(s). (The working capacity is the amount of fuel the tank will hold without triggering the overfill-prevention device.) If you have a tank gauge, order your fuel based on the 90% ullage reading from the tank gauge.
- **Monitor all fuel deliveries from beginning to end.** Delivery drivers tend to be a little more careful if someone is watching. If you have security cameras, focus one on your fuel-delivery area and let drivers know that they are on camera.
- **Inspect your spill buckets routinely.** If necessary, clean before and after each product delivery (see the *TankSmart* Spill Buckets module).
- **Respond to ALL overfill indications.** If your tank gauge is alerting you to overfills, it means you have ordered too much fuel. Most alarms are set at 90% of the tank capacity, so when you have an overfill alarm it doesn't necessarily mean that you have had a spill, but you have come real close.
- **Report, and clean up all spills.** Have spill cleanup materials handy for small spills, and for bigger spills, post emergency phone numbers in a prominent location so you can report the spill to the appropriate authorities.

WHAT DO OVERFILL-PREVENTION DEVICES DO?

Overfill prevention devices are essentially your **BACKUP** if you fail to order the right amount of fuel. Remember, you are the primary overfill-prevention device. The function of overfill-prevention devices is to stop or severely limit the flow of product into the tank **BEFORE** the tank is filled to the very top, so there is still room to fit the contents of the hose into the tank. There are three technologies for doing this:

- ▶ **Ball-float valves** (also known as float-vent valves)
- ▶ **Electronic alarms**
- ▶ **Drop-tube devices** (also known as automatic-shutoff or “flapper” valves)

This module addresses Electronic Alarm Systems.

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Fuel Delivery Terms

Pumped delivery Fuel is pumped under substantial pressure from the truck to the tank. Most often the fuel flows through a long hose (hundreds of feet) stored on a reel on the truck. You receive a delivery ticket printed by a meter on the truck that shows an exact number of gallons delivered.

Gravity delivery Fuel flows under the influence of gravity from the truck to the tank. Most often the fuel flows through a short hose (10 to 20 feet long) that is connected and disconnected to the truck and the tank for each delivery. You receive a bill of lading printed at a terminal or bulk-storage plant that shows the number of gallons loaded onto the truck.

Tight fill The delivery hose is fastened to the fill-pipe opening using a delivery fitting that clamps onto the fill-pipe opening with a liquid-tight connection (see photo on page 1). Gasoline deliveries should be made using tight-fill connections.

Loose fill Delivery is accomplished by inserting a short length of pipe into the tank-fill opening, much the same way as a fueling nozzle is inserted into an automobile fill pipe.



This type of fuel delivery truck most often makes pumped deliveries.



This type of fuel delivery truck most often makes gravity deliveries.

Courtesy of Marcel Moreau Associates, Portland Maine.

ELECTRONIC ALARMS

Of the three available overfill-prevention technologies, electronic alarms are used the least, even though they are the most versatile. Alarms may be used with tanks that receive pumped or gravity deliveries and with tight- or loose-fill connections. A typical overfill alarm is tied into an automatic tank gauging (ATG) system. Most ATGs have the ability to trigger a remote alarm, which should be located outdoors near the fill area and clearly labeled so the driver knows what it is. The alarm is triggered when the tank is 90% full.



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This is a typical unlabeled overfill alarm. These alarms should be labeled so the delivery driver knows where it is and what it is.

Courtesy of Marcel Moreau Associates, Portland Maine.



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Here is a different type of overfill alarm that is labeled so the delivery driver knows that when it sounds, it is talking to him.

HOW DOES AN ELECTRONIC ALARM WORK?

As the underground tank is being filled, a float located inside the tank rises. When it reaches the trigger point, it closes a circuit and the alarm sounds. The fuel-delivery driver must be able to see and hear the alarm while filling the tank. When the driver hears the alarm, he should close the valve at the tanker and drain the delivery hose into the tank.

NOTE: While it is NOT an overfill-prevention device by itself, your ATG will also likely sound a feeble (but annoying) beep when the outdoor alarm goes off.

If you want belt-and-suspenders protection, an alarm is a good backup for either drop-tube or ball-float overfill-prevention devices.

When an overfill alarm triggers often, do not ignore it. It means that there is something wrong with your delivery procedure. Perhaps the working capacity of your tank is less than you think it is. Call your service provider to verify your alarm setting(s) and the working capacity of your tank(s).

To ensure your overfill device is working properly, it must be tested annually during the annual inspection by a Maine-certified tank installer or inspector.