

June 2005 Safety Meeting

Flexible Transfer Hoses

Meeting Purpose

With summer just around the corner, it's a good idea to start thinking about the condition of your flexible transfer hoses. Flexible transfer hoses fall into two (2) major categories: hoses installed on cargo tank vehicles and hoses installed on permanent bulk storage systems. It can be argued that of all the various propane system components, flexible transfer hoses operate in the toughest of environments, including: varying pressures, sunlight, poor weather, abrasive forces, cuts, tears and sometimes abuse. Remember that transfer hoses are subjected to the most stress during transfer operations. Added pressure, temperature and vibration all act upon the hose at the same time. If a failure occurs, more likely than not, you will be seriously injured because of your close proximity. Transfer hoses are the propane industry's equivalent of Rodney Dangerfield—'they don't get any respect'. The purpose of this meeting is to discuss the various safety and operational concerns of flexible transfer hoses.

Hose Failures

Although not common, transfer hoses can fail. Hoses can fail in a number of ways. They can leak small amounts of propane or they can fail catastrophically releasing large volumes of propane liquid to the atmosphere. The propane liquid immediately flashes to vapor and oftentimes finds a source of ignition. You know the rest of that story! The good thing about this issue is that hoses typically don't fail without warning. There is usually one or more warning signs that the hose is in serious trouble well before a failure. However, it's up to drivers and other industry workers to ensure these hoses are inspected and not forgotten. As always, if you have a question about a hose's integrity, don't hesitate to speak with your supervisor.

General Recommendations

Hoses Installed on Cargo Tank Vehicles

Flexible transfer hoses on cargo tank vehicles should be visually examined before each use. Additionally, it is recommended to carefully examine their condition at least once a month. DOT regulations have specific requirements for transfer hose inspection installed on cargo tank motor vehicles. These requirements will be covered at the end of this meeting. Listed below is a review of some of the more important hose inspection procedures, consult your company's policies and procedures as they relate to hose inspections along with the equipment manufacturer's recommendations:

1. Periodically depressurize the hose and lay it out as straight as possible. Look for cuts, abrasion, soft spots, bulges and similar defects.
2. Replace hose if the hose cover is damaged and exposes the underlying reinforcement braid.
3. Check for areas of abrasion that have worn into and through the rubber cover and into the stainless steel reinforcement braid. Look especially at the underside of the hose that contacts the ground. This area degrades as a result of pumping vibrations and dragging the hose on ground surfaces. Hoses that show damage in this area should be replaced.
4. Check the area back from each end fitting for at least 18 inches. Check for soft spots, bulges, and leaks. This area of the hose receives a great deal of stress from bending, twisting and pulling. Additionally, sometimes hose-end fittings will start to slip. Excessive slippage could result in the fitting separating from the end of the hose leading to an uncontrolled release of product. Check for evidence of slippage, damage or worn end fittings, especially at the threaded areas.
5. Look for signs of abuse such as stretching, kinking, flattening by a vehicle or weather cracks. Any such abuse is cause for hose replacement.
6. Look for loose or missing bolts or fasteners that secure hoses and make sure the appropriate gaskets/o-rings are in place at all times.
7. Re-pressurize the hose and recheck.

DOT Requirements for Checking Hoses

1. Each delivery hose must be permanently marked with an identification number and maximum working pressure. Drivers should periodically check to ensure this marking is in place and legible.

2. After each delivery, the driver must visually check that portion of the delivery hose assembly deployed during the delivery.
3. At least once a month the driver has to check the integrity of the delivery hose (see the steps above). Inspection results must be documented along with other required cargo tank checks.

Note: Field repairs of transfer hoses are not acceptable. Damaged hoses should be removed and replaced with certified hoses made by a reputable manufacturer. New hoses must be accompanied by the appropriate test and certification documentation.

Hoses Installed on Bulk Storage Systems

Like cargo tank vehicles, flexible transfer hoses installed on bulk storage systems should be visually examined before each use. Listed below are some of the items to check for PRIOR to connecting the hose for liquid transfer:

1. Check for cracking/checking of the outer hose cover.
2. Check for bulges, cuts and tears on the outer hose surface that penetrate into the reinforcement braiding underneath the outer cover.
3. Check for leaks.
4. Check for the presence of sealing gaskets/o-rings necessary for a leak-tight seal.
5. Check for signs the hose-end fittings are loose or slipping.
6. Check the condition of the fittings for cracks or excessive wear on the threaded, sealing or connective elements.
7. Check for signs the hose has been deformed by a vehicle running over it.
8. Check for signs of debris or foreign material inside the hose-end fitting.
9. If a problem is discovered, replace or red tag any defective hose before the next transfer. Don't get into the habit of saying "this hose will work for another fill", it might not!!!

Closing Comments

Take advantage of the opportunities you have to inspect flexible transfer hoses, you could be sorry for an extremely long time; you, your customer and your family will be glad you did!

Instructor Notes

At this time, if your company has a hose inspection policy in place, the trainer should review with each attendee your company's policies. Ask your employees about specific times when transfer hoses have been found with a defect and subsequently replaced. Ask employees what procedures they enlist to check hoses? Remind participants of the various locations of flexible transfer hoses at your plant and on your trucks. If you have defective hoses that have been removed because they were defective, show them to the participants and discuss the various problems. Take the participants to the yard and inspect all the flexible transfer hoses using the above procedures at the plant and on each truck. Make note of any hoses that are found with a problem and replace them as soon as possible or red tag the hose system if it represents an imminent danger.

June 2005 Test

Flexible Transfer Hoses

Name: _____

Date: _____

Instructions: Read and answer each of the following questions. When complete, grade the test and review incorrect answers so each employee is “armed” with the correct answers before they leave the training.

1. According to this safety meeting, flexible transfer hoses fall into ____ major categories:
 - a. 1
 - b. 2
 - c. 3
 - d. 4

2. The DOT has specific requirements for transfer hoses installed on cargo tank motor vehicles.
 - a. True
 - b. False

3. Name the operating environments transfer hoses operate in:
 - a. varying pressures
 - b. elevated temperatures
 - c. vibration
 - d. abrasive forces
 - e. All of the above

4. Transfer hoses rarely fail without warning. Keeping a close visual watch on these components will typically prevent accidents.
 - a. True
 - b. False

5. As a general rule, flexible transfer hoses should be inspected _____.
 - a. every six months
 - b. every year
 - c. every 3 months
 - d. before each use

6. On cargo tank vehicles, it's generally recommended to _____ the hose prior to performing a monthly inspection.
 - a. pressurize
 - b. heat
 - c. de-pressurize
 - d. stretch

7. When inspecting a flexible transfer hose, the area _____ inches back from the hose-end connector is most important.
 - a. 10
 - b. 16
 - c. 18
 - d. 36

8. On bobtail trucks, each flexible delivery hose must be marked with an identification number and the hose's maximum working pressure.
 - a. True
 - b. False

9. The _____ area of a flexible transfer hose is most critical during an inspection because its not easily seen.
- a. side
 - b. underneath
 - c. top
10. A hose that is only slightly deformed by a vehicle running over it need not be replaced as long as there is not a leak.
- a. True
 - b. False

June 2005 Test

Answer Sheet

- | | |
|-----|----|
| 1. | b. |
| 2. | a. |
| 3. | e. |
| 4. | a. |
| 5. | d. |
| 6. | c. |
| 7. | c. |
| 8. | a. |
| 9. | b. |
| 10. | b. |