Common Covered Task 005
Inspect and Calibrate Breakout Tank Overfill Protective Devices

Directions

This training guide is to be used by a Veriforce Authorized Evaluator/Trainer and Trainee during on-the-job training (OJT) or prior to an evaluation as a resource. (S) Indicates a demonstration or skill task; (K) indicates a knowledge task.

OJT Reminder

OJT is an active hands-on process. Practice should be as similar to the actual job task as possible. However, if the training is being provided on an actual job site while a covered task is actually being performed, the Evaluator either needs to be qualified on that covered task or be assisted by someone who is qualified on the covered task. The Evaluator should closely monitor the Trainee's practices to ensure safe and correct task performance. At no time should a non-qualified individual perform, or train for, a covered task unless directed and observed by a qualified individual. However, if the ***"span of control"*** for that particular covered task is "1:0" (requiring only qualified individuals to perform the covered task), the training must be simulated. Training is simulated by "walking through" the task and simulating all actual manipulations (valves, switches, tools, etc.) an individual would use during the performance of a covered task. Simulating includes the use of safety and administrative requirements as if the task were being performed live. Refer to the Veriforce Evaluator Training Program for more on how to conduct formal OJT.

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Recommended Student Training or Resources:

- DOT 49 CFR 195.428

Introduction

An overfill protection device is a device used to prevent overfill or alert breakout tank operators that fluid level in the tank has reached a potentially dangerous level. Some devices can simply activate an alarm, while others may be able to shut down any flow into the breakout tank automatically with no operator interaction.

Knowledge: Explain the key indicators used in categorizing breakout tank overfill protection systems.

Breakout tank overfill protection is divided into categories. The categories classify breakout tank facilities based on certain characteristics of the facility's overfill protection.

Category 1

Category 1 facilities are operated manually. Meaning that an individual must physically be at the tank to control fluid transfers in and out of the tank.

Breakout tanks at category 1 facilities either have to be measured or ***strapped*** manually for volume or may be equipped with some sort of automatic tank gauging system (ATGS), such as a ball float-operated volume meter.

The overfill protection for a category 1 breakout tank facility is totally dependent on the local tank operator. If there are no alarms, the operator will have to pay close attention to the amount of fluid that is entering the breakout tank. The operator will have to manually stop the fluid from entering the breakout tank to prevent overfill.

Category 2

Category 2 facilities can be run either manually or remotely or through a combination of the two. If a local operator is not present at a category 2 breakout tank, then an operator in a control room should be able to control the flow of fluid in and out of the tank.

Category 2 facilities should be using an ATGS for measuring fluid levels in the tank. The ATGS should also have an alarm. The alarm can be a light, siren, or combination of the two that activates when a dangerous fluid level is reached.

Category 3

Category 3 breakout tank facilities are very similar to category 2. They can be operated both locally at the tank and remotely from a control center.

Category 3 facilities will also have ATGS with alarms that should activate when a predetermined fluid level is reached inside the tank, just like category 2 facilities.

The difference between the two categories is that category 3 facilities must have an independent alarm system when the high-high fluid level of concern is reached. (Fluid levels of concern will be covered in our next objective.) This alarm is in addition to the ATGS and any other alarms associated with the ATGS. Having two different independent systems creates redundancy in the breakout tank's overfill protection. This means that should the ATGS fail for some reason, the additional high-high level alarm should continue to function.

AOPS

Many breakout tank operators believe there should be a fourth category for an automatic overfill protection system (or AOPS). An AOPS would more than likely be combined with category 2 or category 3 facility overfill protection systems. The AOPS can completely control the flow of fluid in and out of the tank, meaning that in the event of an overfill condition, the system will stop flow. The AOPS does not require an operator to perform this function. If the entire breakout tank facility is equipped with an AOPS, then there is no need for that facility to be manned.

The AOPS should be independent and in addition to any other systems, such as the ATGS, just like in category 3 facilities. This way, should the ATGS fail, the AOPS will continue to function and operate in an overfill situation.

Knowledge:	Identify the levels of concern used for breakout tank overfill protection systems.

Levels of concern (or LOCs) are the fluid levels in a breakout tank that are predetermined for normal operations and possible hazardous conditions. One of the main considerations when determining the levels of concern for a breakout tank is the response time of the breakout tank facility personnel to respond to an overfill situation. The following are some of the generally used levels of concern.

Maximum Working Level

The maximum working level is the maximum amount of fluid that the breakout tank should be filled to during normal tank operations. If needed, a breakout tank facility operator may need to check the ATGS or strap the tank to see if this level has been reached. Depending on the facility, there may or may not be an alarm or indicator that would activate if the LOC has been reached.

High-High Level

The high-high LOC is the first level at which category 2 and category 3 facilities need to have some sort of alarm indicating this level has been reached. For clarification of what to do if this level is reached, consult with the pipeline operator representative or pipeline operator procedures for the actions that may need to be taken to prevent further fluid from entering the breakout tank. An example of a breakout tank operator action could be the manual closing of the valve used to fill the tank with fluid.

AOPS (Optional Level)

As mentioned earlier in the course, some category 2 and 3 breakout tank facilities may have breakout tanks equipped with an AOPS. If an AOPS is in place, it may have its own LOC. If the breakout tank does have an AOPS LOC, then the system will begin to operate at this level. The independent AOPS alarm should register at this level, and the AOPS should automatically stop flow coming into the breakout tank.

Critical High Level

At this level, overfill is likely to occur. Besides damage to the breakout tank, injury to operator personnel and impact to the environment could occur. Another alarm should sound at this level. Emergency overfill procedures must be consulted and activated when this level is reached.

Knowledge:	Explain what is required prior to performing this task.

In this objective, we will cover what's needed prior to performing any repairs on breakout tank overfill protective devices.

Operator-Approved Procedures

Before starting any repairs on breakout tank overfill protective devices, you need to refer to the pipeline operator-approved procedures on how to perform any of the tasks associated with the repair of the overfill protection device. The pipeline operator-approved procedures should contain information such as how to safely isolate the breakout tank and associated equipment from operation. This will allow repairs to be conducted safely. The pipeline operator-approved procedures may contain operation and maintenance information that can provide you with any equipment specifications you may need to complete this task. If the operation and maintenance information is not in the procedures, the procedures may contain the location of the operation and maintenance manual for the breakout tank overfill protective device you will be working on.

Appropriate Equipment/Material

Before performing this task, you will need to gather all appropriate equipment and material needed to safely complete the task. Examples of appropriate equipment and material could include personal protective equipment (PPE), ***strapping charts***, or any other specific tools needed to complete the task.

Knowledge/Skill: Describe the necessary steps and operation requirements for repairs of overfill protection devices.

Overfill devices, just like any other mechanical equipment, need to be maintained and tested. When repairing the overfill devices on your breakout tanks, always follow the pipeline operator's procedures and manufacturer's specifications for the overfill devices in your facility.

You will also need to consult all manufacturers' instructions when repairing an overfill protective device. There may be different types of overfill protective devices at your facility. When repairing, make sure the manufacturer's instructions for repairs match the overfill protective device type and model that you are working on.

Some manufacturers may require that only trained or manufacturer-certified repair technicians repair their overfill protective devices or certain components of the overfill protection system (or OPS). Repairs performed by an unauthorized repair person may cause the overfill protective device to not function as desired and may void any warranties on the overfill protective device and the overfill protection system.

When repairing breakout tank overfill protective devices, the main focus is to ensure the devices are operable and capable of acknowledging and responding to an overfill condition. To accomplish this, the overfill protective device should be tested after repairs have been performed in order to make sure they function correctly. Always refer to the pipeline operator's procedures and the manufacturer's specifications before performing any tests on overfill protective devices. The testing of the device could include the activation of alarms, the shutdown of fluid entering the tank, or the isolation of the breakout tank from the active system. The testing should conclude that the device would prevent an overfill condition from occurring.

Some overfill devices will have moving components. If scratches, dents, or gouges on these components are present, this could be an indication of a mechanical issue that could affect the ability of the device to move. One possible testing method for movable parts is to manually move the parts to see if the alarms trigger. For example, you could raise a float detector manually to the desired level of concern to see if the overfill protection system responds. Also, if the overfill device uses fluid-sensing equipment, you may be able to test it by using a wet probe to contact the fluid-sensing area of the device.

Many OPS in use for category 2 and 3 facilities have built-in proof-testing methods. These testing methods could range from a simple push-button test to switching relays around inside the controlling device to simulate the alarms. Regardless of the testing method, it is extremely important to make sure the equipment is capable of acknowledging and responding to an overfill condition and is operable after repairs. Once again, when asked to test the OPS, follow your pipeline operator's procedures for the OPS on the breakout tank you're testing.

Abnormal Operating Conditions (AOCs)

Candidates are required to possess the ability to **RECOGNIZE** and **REACT** to the listed AOCs for each task. Be prepared to answer questions concerning additional AOCs that may be relevant. Evaluators may ask questions about AOCs throughout the evaluation.

An AOC is defined in **49 CFR §§ 192.803** and **195.503** as:

A condition identified by the pipeline operator that may indicate a malfunction of a component or deviation from normal operations that may:

- Indicate a condition exceeding design limits; or
- Result in a hazard(s) to persons, property, or the environment.

While performing breakout tank inspections on a pipeline facility, at a minimum you will be required to recognize and react to the following AOCs.

Recognize: Unintentional releases, vapors, or hazardous atmosphere could be signs that an abnormal operating condition has occurred. Examples could include, but are not limited to:

- Puddles
- Ice accumulation
- Vapors

React/Respond: Proper reactions and/or responses to take in the event of an unintentional release, vapors, or hazardous atmosphere include the following:

- Eliminate potential ignition sources.
- Move to a safe location.
- Notify emergency response personnel, as appropriate.
- Notify the designated pipeline operator representative.

Recognize: Material defects, anomalies, or physical damage of a pipe or component are abnormal operating conditions. Examples could include, but are not limited to:

- Broken/damaged components
- Plugged devices
- Corrosion

React/Respond: Proper reactions/responses to take in the event of material defects, anomalies, or physical damage of a pipe or component include the following:

- Stop the activity and notify the designated pipeline operator representative.
- Mark the location so it may be easily located.

Recognize: An unintended fire and/or explosion on or near the pipeline is an abnormal operating condition.

React/Respond: Proper reactions/responses to take in the event of an unintended fire and/or explosion on or near the facility include the following:

- Move to a safe location.
- Notify emergency response personnel, as appropriate.
- Notify the designated pipeline operator representative.

Recognize: Failure or malfunction of pipeline component(s) is an abnormal operating condition. Examples could include, but are not limited to:

- Alarm/lights failure
- Instrumentation failure
- Leaking tubing
- Unexpected relief valve operation

React/Respond: Proper reactions/responses to take in the event of failure or malfunction of pipeline component(s) include the following:

- Stop the activity.
- Notify the designated pipeline operator representative.

Glossary

AOC
abnormal operating condition

CCT
common covered task

CFR
Code of Federal Regulations

strapping
measurement of storage tank fluid used to calculate the amount of fluid in the tank and how much more fluid the tank can hold.

strapping chart
a chart that tells you what volume you have at what levels. For example, at 5 inches, you may have 5 gallons, and at 8.5 inches, you might have 10 gallons.