

Common Covered Task 016 Purging – Hazardous Liquids

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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Common Covered Task 016 Purging – Hazardous Liquids

Recommended Student Training or Resources:

- DOT 49 CFR 195.402(c)(10)

Knowledge: Explain what is required prior to purging hazardous liquids.

Operator-Approved Procedures

Before beginning your task, the pipeline operator will provide you with site-specific procedures for purging a hazardous liquid. Purging procedures may vary between operators; however, they will typically include, but are not limited to, the following: personnel responsibilities, method of communication, equipment used, facility and/or pipeline to be purged, purging specifications, isolation requirements, evacuation/emergency response, and notifications to public safety agencies.

Appropriate Equipment/Materials

It's also important that only appropriate equipment and/or materials are used when purging. These may include, but are not limited to, operations and maintenance manuals, as-builts, isolation tools, pressure gauges, multi-gas detectors, fire-fighting equipment, and personal protective equipment (PPE).

Knowledge: Describe the requirements for purging hazardous liquids from pipeline facilities.

The isolation method selected depends on the pipeline operator's system and its structural and operating conditions. One or more combinations of the methods we'll discuss may be used, so refer to your pipeline operator.

Use of Installed Existing Pipeline Valves

The first step in the purging procedure is to select the method of product isolation. Valves provide the most common and simplest form of isolation as they are already installed, quick to use, and easily operated. Valves should be carefully examined, cleaned, and conditioned to ensure there is no seal damage. When using a valve for isolation, follow your pipeline operator's procedure for lockout/tagout. If a valve cannot seal effectively, then some additional method of isolation must be used.

Installation of Stopper Fittings

Using a stopper fitting to stop the flow in the pipe is another method of isolation. This method can be used in areas where valves are not conveniently located or when corrosion may be present inside the pipe. Stopper fittings can also be used to divert flow around the segment to be purged and allow continued service, if needed. Hot tapping may be needed to install a stopper fitting. Follow the manufacturer's instructions on how to properly install a stopper fitting, if qualified to do so. After the hot tap is complete, a stopper fitting is attached to the valve that was used to conduct the hot tap. Then, the valve is opened, and the stopper fitting is pushed inward to seal the pipeline.

Rated Skilllets, Blinds, etc.

Another method of isolation is the use of rated skilllets and/or blinds. This method is generally reserved for locations where valves cannot be used or sealed effectively. They provide a simple, mechanical means of physically isolating the pipe.

A rated skillet is a solid metal plate that completely covers the inside of the pipeline. It's capable of withstanding the maximum pressure of the pipeline with no leakage beyond the plate. The skillet has a handle on the top of it, which serves as a visible indicator of its positioning and may provide a location for tagging, depending on the design style. A blind serves the same function as the rated skillet but has a different look. A blind is a solid metal plate that is bolted between two flanges. It's machined to match the size and rating of the corresponding flange. The thickness of the blind is based on the line pressure and pipe size.

Both rated skillets and blinds can provide a permanent or long-term isolation solution when properly designed and securely installed. Always refer to the pipeline operator's approved procedure for their preferred method of isolation.

Knowledge: Identify the proper methods for draining the product from the pipeline, as applicable.

Purging plans are site-specific and your pipeline operator may use various techniques for draining the product from the pipeline. Before beginning any draining activity, refer to your pipeline operator and your current procedures.

Drain Down

Your pipeline operator will identify what is going to be drained and how to drain it. They may request you use a drain down method. Here, an upstream valve is closed off, and gravity is used to drain the pipeline into a tank, downhill from the starting point. This method may not remove all of the liquid, so you may be required to take further action, such as pigging the line.

Vacuum Truck

Another method is to use a vacuum truck. A vacuum truck is a tank truck with a heavy duty vacuum pump connected to a suction line. It is designed to drain liquids from a pipeline and may be an approved method if the pipeline is designed to withstand vacuum pressure. An inert atmosphere is created within the pipe by repeatedly draining the pipeline of hazardous liquid and filling it with inert gas. When using the vacuum truck method, always ensure that the equipment is in good working order and is clean and free of any substance that may react to the liquids being vacuumed. Also, verify with the manufacturer's guidelines that the vacuum equipment is designed to handle a hazardous liquid before beginning.

Barrels

You can also drain small amounts of liquid out of a pipeline using a barrel or another pipeline operator-approved medium. Barrels may be used for maintenance activities that involve small amounts of liquids, such as pump repairs. The pipeline operator may also have you use barrels to document the amount of product that has been removed.

Portable Flare

A portable flare can also be used to assist you in draining a pipeline. Flaring is the controlled burning of hazardous liquid. It's vented outside at the end of a flare stack or boom and is typically monitored throughout the process. Flares should be located away from overhead power lines, aircraft landing patterns, and other potential sources of ignition. Take care to minimize any danger to the public when using flares.

Knowledge: Describe the steps required to prepare for purging.

Review pipeline operator-approved purge procedure.

The pipeline operator may provide you with a written purge plan. Always review this plan before each job as your pipeline operator may use different isolation and/or draining methods at different locations or they may use a combination of methods. In addition to the purge procedure, the information covered in this plan may also refer to the use of lockout/tagout procedures.

Obtain authorization from pipeline control center and/or other appropriate personnel.

You'll also need to obtain authorization from the pipeline control center and/or other appropriate personnel, such as the pipeline operator's designated representative, before starting the purge. It's the control center's responsibility to constantly monitor the pipeline, so they must be notified when the event will start and end. This will ensure that all affected personnel are aware of what is about to happen and allow them to minimize any work from being performed near the area of isolation.

Knowledge: Describe how to properly identify equipment requirements.

Ensure the identification of any drain down or evacuation equipment has been made.

The pipeline operator may require you to stage the equipment to ensure all appropriate tools are located at the proper areas. Ensure that any drain down or evacuation equipment has been identified by using all available records, such as maps, as-builts, and/or installation drawings.

Sufficient equipment is staged correctly for the purging process.

Ensure sufficient equipment is staged correctly for the purging process. Utilize pre-job specifications that have been verified by engineering and local personnel. The facility's operating personnel will prepare any equipment for emptying, flushing, or purging pipelines and/or vessels as required.

Knowledge: Explain how to identify the correct valves or stopple fittings for isolating the segment of pipeline to be purged.

Ensure that each valve or stopple fitting identified for isolation is in its correct position (open or closed).

Ensure sufficient equipment is staged correctly for the purging process. Utilize pre-job specifications that have been verified by engineering and local personnel. The facility's operating personnel will prepare any equipment for emptying, flushing, or purging pipelines and/or vessels as required.

Identify pipeline condition monitoring points to determine proper isolation is achieved by the component used (fitting, valve, etc.).

Prior to starting the purge, verify that isolation of the system has been accomplished by the components. Ensure that each isolating device has all appropriate lockout/tagout devices correctly installed. Periodically check the pipeline's condition monitoring points, such as pressure gauges, flow conditions, and temperatures, as outlined in your pipeline operator's procedures.

Ensure pipeline condition monitoring points indicate the pipeline is empty and no residual product remains.

Use the pipeline's condition monitoring points to verify that the pipeline is empty and no residual product remains. This may include, but is not limited to, checking pressure gauges for a pressure reading, opening and clearing bleed lines, and examining the atmosphere near the isolation zone using a multi-gas detector.

Skill: Describe the steps to determine when the purging procedure has been completed.

Using operating condition monitoring equipment, (pressure, temperature and/or flow indicators) verify all product is purged from the pipeline segment.

To determine if the purging procedure has been completed, perform the following steps. First, use the operating condition monitoring equipment to verify that all product has been purged from the pipeline segment. Next, monitor the pressure, temperature, and/or flow indicators in the isolated segment to determine if any product remains in the pipeline. Note: all product should be purged from the pipeline. In addition, please keep in mind that pipelines and facilities may vary. Therefore, consult with the pipeline operator's written purge procedure for specific instructions and requirements.

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.

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:

- Blowing gas
- Unexpected liquids

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

- Determine the appropriate action(s) to eliminate hazard(s).
- Eliminate potential ignition sources.
- Move to a safe location.
- Notify emergency response personnel, as appropriate.

Recognize: An unintended fire and/or explosion on, near, or inside 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 pipeline include the following:

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

Recognize: The inability to complete a purge of hazardous liquids is an abnormal operating condition.

React/Respond: Proper reactions/responses to take in the event that you are unable to complete a purge 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