Common Covered Task 704
Permanent Field Repair by Grinding

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 192.713
- DOT 49 CFR 195.226
- DOT 49 CFR 195.230

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

Pipeline Operator-Approved Procedures and Appropriate Equipment/Material

Prior to performing this task, you will need to have the pipeline operator-approved procedures as well as the appropriate equipment and materials. The procedures will outline requirements for performing this task that are specific to the pipeline operator. Operators may also have specific requirements regarding the type of equipment that can be used to perform this task.

Therefore, it's important to follow the specific requirements of the procedures and only use operator-approved equipment. Doing so can ensure the task is performed correctly and according to the pipeline operator's standards.

Knowledge: Describe the steps for making permanent repairs of imperfections or damage by grinding.

Imperfections such as cracks, gouges, grooves, and arc burns found on a pipeline are examples of defects that need to be repaired. One way you might be able to repair these defects is by grinding.

The steps for making permanent field repairs of imperfections on a pipeline by grinding include the following:

- Verify the wall thickness in the defect area and establish the minimum allowable wall thickness.
- Verify that the pressure is at a safe level.
- Grind the defect in a circumferential direction and monitor the wall thickness during the grinding process.
- Contour or smooth the area around the defect to provide a smooth transition to the unaffected pipe surface.
- Verify the remaining wall thickness is within allowable limits.
- Make sure that a qualified person inspects the area for cracking with wet mag particle or other operator-approved methods.

Verify the wall thickness in the defect area and establish the minimum allowable wall thickness.

Prior to performing any grinding, you must verify the wall thickness of the area in question and ensure that it meets the minimum allowable thickness established by the pipeline operator. There are different types of tools and methods available for determining wall thickness. The most common is the ultrasonic (UT) meter. Measuring wall thickness with a UT meter is a covered task that must be performed by a qualified individual.

Verify that the pressure is at a safe level.

Prior to repairing a pipeline, certain risk factors must be considered. The pipeline operator will determine if the pipeline will need to be taken out of service or if the repair can be safely performed by reducing pressure. If it is

deemed that the pipeline can remain in service for the repair, the operator will establish a safe level of pressure in the section of the pipeline to be repaired. You should verify that the pipeline pressure has either been lowered to the required safe levels set forth by the pipeline operator or that the pipeline has been removed from service and bled down or purged if required.

Grind the defect in a circumferential direction and monitor wall thickness during grinding process.

Before grinding the defect, take a moment and check the area that you will be working in for potential hazards. Friction caused by grinding increases heat to the pipeline and creates sparks. If the area to be repaired has materials that have a negative reaction to heat and sparks, you could inadvertently cause the material to ignite or produce hazardous vapors. To address this hazard, you should ensure that the area to be repaired is clean and free of hazardous materials and surrounding vegetation is cleared or wet to prevent fires.

The next step is to grind the defect. The best method for doing this is to grind the defect out in a ***circumferential*** direction, following the outer edge of the pipe that forms a circle. This will aid in consistency and prevent gouging caused by grinding.

During the grinding process, you should periodically measure the wall thickness. Measuring the wall thickness in the affected area is performed to determine that any metal loss is in accordance with the requirements set forth by the pipeline operator. If the thickness is less than the minimum established, you should stop grinding immediately and notify the pipeline operator's designated representative.

Contour the area around the defect to provide a smooth transition to the unaffected pipe surface.

Part of making the repair involves providing a seamless transition to the unaffected pipe surface. To do this, you should contour or smooth the area around the defect.

Verify the remaining wall thickness is within allowable limits.

Once your repair is complete, the pipeline operator will require confirmation that the wall thickness in the affected area is within the set standards. As mentioned earlier, the wall thickness can be measured by a qualified person using a UT device.

Make sure that a qualified person inspects the area for cracking with wet mag particle or other operator-approved method.

Once the repair is complete, a qualified individual will need to inspect the area for cracking and will confirm complete removal of the defect by using dye penetrant, magnetic particle inspection, or an approved non-destructive method.

Skill:	Demonstrate the proper grinding procedure by removing a gouge from a piece of scrap pipe.

Before starting the grinding operation, you should ensure the surface of the substrate you are grinding is clean and free of any hazardous materials. Check around your work area and clear any combustible materials, such as dry or dead vegetation. Make sure a fire watch is in place and that you have all required PPE. Ensure your electrical lines do not pose a tripping hazard and are clearly visible for others to see.

Inspect the grinder and wheel for any damage. As an added safety measure when changing the wheel, you should unplug the grinder. It is a good practice to run new wheels for one minute in a protected area before using them to make sure the wheel isn't defective.

If at all possible, orient the material so the wheel spins away from, not into, sharp edges. The grinding wheel can catch on an edge and throw the work piece or cause the grinder to kick back.

Start the grinder and move the grinding wheel steadily across the area to be repaired in a circular motion using light pressure. Applying heavy pressure and/or changing angles during grinding can cause added damage to the pipeline or remove too much surface metal. You should stop frequently to inspect the area and measure the wall thickness of the pipe.

Grinding requires attention to detail and patience. You should never try to remove an imperfection with one pass or apply too much pressure. Take your time, use light pressure, and frequently stop to check your work. The safety and integrity of the pipeline is directly affected by your ability to perform this task correctly.

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: An unintentional release, vapors, or hazardous atmosphere are abnormal operating conditions. Examples could include, but are not limited to:

- Blowing gas
- Puddles

React/Respond: Proper reactions/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 designated pipeline operator representative.

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 pipeline include the following:

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

Recognize: Material defects, anomalies, or physical damage of pipe or a component that have impaired or are likely to impair the serviceability of the pipeline are abnormal operating conditions. Examples could include, but are not limited to:

- Previously unidentified subsurface defects, such as lamination, inclusions, and cracking

React/Respond: Proper reactions/responses to take in the event of material defects, anomalies, or physical damage of pipe or a component that have impaired or are likely to impair the serviceability of the pipeline include the following:

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

Recognize: Unintended movement of a pipeline that has impaired or is likely to impair the serviceability of the pipeline is an abnormal operating condition. Examples could include, but are not limited to:

- Earthquake
- Soil instability
- Equipment vibration
- Inadequate pipe support

React/Respond: Proper reactions/responses to take in the event of unintended movement of a pipeline that has impaired or is likely to impair the serviceability of the pipeline include the following:

- Stop activity.
- Notify designated pipeline operator representative.

Glossary

AOC
abnormal operating condition

CCT
common covered task

CFR
Code of Federal Regulations