

Common Covered Task 215 Joining of Metal Pipe – Flanged Connections

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 192.271
- DOT 49 CFR 192.273
- DOT 49 CFR 195.126

Knowledge: Explain what is required prior to performing task.

When joining metal pipe with a flanged connection, you will need the following:

- Appropriate equipment/materials
- Operator-approved procedures

Equipment includes the tools needed to perform the task. Examples may include, but are not limited to, a torque wrench and sockets.

Materials include the fittings or flanges themselves. After verifying that you have the correct piece, you must also ensure you have all the components needed for installation, such as gaskets and proper nuts/bolts.

It's also important to have and follow your operator procedures as they will specify how to install the components properly.

Skill: Demonstrate joining of metal pipe by flanged connection.

A flange is a protruding rim, edge, rib, or collar on a pipe shaft. It is used to strengthen a pipe, hold it in place, or attach it to another pipe or object such as valves and tee connections. There are several different type and styles of flange connections. The most common found on the pipeline are bolted and threaded flange connections.

For more information on threaded flanges, please refer to CCT - 214 in the VeriSource online CCT training tab.

Prior to installing a flange on the pipeline, you must ensure that you have all the proper materials, to include: the size, fitting, gasket, and correct rating of the flange materials.

Verify the flange ratings against the operator's written requirements and procedures to ensure the flange meets or exceeds the operator's requirements. Most flange components will be stamped or marked with the size, pressure rating, and other pertinent information. If there is no stamp or marking, notify the designated operator representative for guidance on use.

After you have verified that the flange meets or exceeds the operator's requirements, you will need to inspect the flange. At a minimum, the faces of the flange should be clean and free of any foreign debris. Additionally, you should inspect for any nicks or damage on the connecting face of the flange to ensure proper sealing.

The first step to installing the flange is to ensure both faces are aligned properly. Doing so will ensure correct fitment of the two sides being mated together, and provide a proper seal. To align the flange, insert bolts/studs on the bottom portion of the flange, and install the component you wish to connect to the flange. This will aid in keeping the flange aligned while installing the gasket.

When inserting the gasket between the flange faces, care must be taken not to fold or damage the gasket. Any fold or misalignment will cause leaks in the flange. Once you have properly inserted the gasket, install the remaining bolts/studs, and then secure them on the flange by screwing them in to a snug fit. Do not over tighten the nuts. The initial tightening should be hand tight or a snug fit at most.

After all the nuts are installed in a snug fit, you can begin to tighten them. **Note:** Flange nuts should be tightened to specified value using proper sequence of tightening.

Ensure all nuts are fully engaged. Fully Engaged is generally defined as ensuring that the bolt threads extend completely through the mating nut.

To confirm that the flange has sealed properly, you will need to check for leaks. There are several products on the market available for detecting leaks, from ultrasonic devices to simple liquid based solutions. A common cost effective method for checking for leaks is to use a liquid solution, such as “Snoop,” that will bubble around the area where a leak is present.

Flanges are invaluable to a pipeline system. They offer fairly quick and easy installation of valves, added pipe, and numerous other pipeline related materials. The proper function and integrity of the pipeline rests on your ability to properly comprehend and adhere to all manufacturer and operator instructions during the inspection, verification, assembly, and while checking for leaks. Lastly, there is no substitute for hands-on training and direct trainer involvement. With that said, this training is not intended to substitute any hands-on training.

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
- Puddles
- Dead vegetation
- Vapors from casing vents

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 operator representative.

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

- Misalignment
- Gasket damage
- Damaged flange face
- Stripped threads

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

- Stop activity and notify designated 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 pipeline include the following:

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

Glossary

AOC

abnormal operating condition

CCT

common covered task

CFR

Code of Federal Regulations