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Task 40.1—Fit Full Encirclement Welded Split Sleeve (Oversleeve, Tight-fitting Sleeve, etc.)

1.0 Task Description

The full encirclement welded split sleeve is a type of repair used for covering anomalies on a pipeline with two halves installed around the circumference of the pipeline in preparation for welding. Full encirclement split sleeves are designed to be installed on an in-service pipeline.

This task begins with the confirming the preparation of the carrier pipe, and this task ends with confirmation that the sleeves are correctly installed and the proper welding gap has been established.

This task does not include but may lead to the performance of other covered tasks such as the following.

- Perform NDT—Ultrasonic Testing (reference Task 38.7).
- Perform Welding (reference Task 42.7).

2.0 Knowledge Component

The full encirclement welded split sleeve is a permanent pressure-containing repair applied to a leaking or nonleaking defect.

An individual performing this task must have knowledge of the following.

- This type of sleeve may also be applied to reinforce the wall of the carrier pipeline where a defect exists. The length of the sleeve varies according to the extent of the defect to be repaired. Type A sleeve installation parameters are dictated by the welding procedure used.

Terms applicable to this task are as follows.

Full encirclement sleeve

Rolled steel formed in two halves to encase the pipeline. The pressure rating of the sleeve must be equal to or greater than the carrier pipe.

Type A sleeve

A steel split sleeve that only requires welding of the longitudinal seams of the sleeves. It is installed under compression.

Type B sleeve

A steel split sleeve that requires welding the longitudinal seams of sleeves and welding the ends of the sleeves to the carrier pipe.

AOCs associated with the performance of this task include the following.

AOC Recognition	AOC Reaction
Anomaly or other defect on carrier pipe outside the area of application.	Notify the Operator or appropriate individual.

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3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps.

Step	Action	Explanation
1	Confirm surface has been properly prepared according to applicable covered task.	Coating removal and surface preparation is performed under Tasks 13.1, 13.2, or 13.3.
2	Confirm pipe surface has been inspected for dents, gouges, or other irregularity according to applicable covered task.	Inspection of the pipe surface is performed under Tasks 5.1, 5.2, or 5.3.
3	Confirm proper type of sleeve to be installed.	Ensures proper type of sleeve will be installed. Type A sleeves are installed to reinforce the carrier pipe. Type B sleeves are installed for pressure-containing purposes.
4	Fill defects as needed, with Operator-approved material. Filler material shall be applied following manufacturer's recommendations.	Restricts flexion of carrier pipe to maintain integrity.
5	If the installation is to be a Type B sleeve, confirm acceptable wall thickness has been measured in the seal welding zones according to the applicable covered task.	Ensures integrity of carrier pipe at location of split sleeve ends to be welded for a Type B sleeve. Wall thickness measurement is performed under Task 8.2.
6	If the installation is to be a Type A sleeve, follow the welding procedure to ensure the proper fit.	The welding procedure determines the techniques to apply compression to the sleeve and may include preheating and mechanical compression.
7	Verify proper sleeve length and material grade per Operator procedures.	Ensures sleeve meets Operator standards, manufacturer's specifications, and industry codes.
8	Prepare and fit the sleeve to the pipeline.	Ensures proper coverage of defect and fit of the sleeve.
9	Use lifting device and chains or clamps to achieve a proper fit and an equal welding gap for the longitudinal seam, as necessary.	Ensures proper coverage of defect and fit of sleeve. Improper use of the lifting device could result in damage to the carrier pipe.
10	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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Task 40.3—Apply Composite Sleeve

1.0 Task Description

Application of composite material repairs corrosion and mechanical damage defects for an in-service pipeline.

This task begins with confirming the preparations of the pipe as required by the manufacturer prior to applying the composite material and ends with a completed application as defined in the manufacturer's procedures.

2.0 Knowledge Component

The application of composite material in the form of multiple layers of woven fiber wrap or rigid fiber sleeves is an acceptable alternative to steel split sleeves for repairing corrosion and mechanical damage defects. Composite sleeves are designed to be applied to an in-service pipeline. The process also includes the application of filler material to eliminate voids and dents in the carrier pipe surface prior to applying the composite sleeve.

Composite sleeve manufacturers have structured curriculum, training, and certification processes to ensure installers have the knowledge and skills necessary to install their product in accordance with their specifications.

An individual performing this task must have knowledge of the following:

- A composite material must be installed according to the manufacturer's procedures. The material consists of woven fiber cloth wrapped around the carrier pipe or rigid fiber sleeves shaped to fit the circumference of the carrier pipe. A chemical bonding system is used to adhere the material to the carrier pipe to establish the repair.

Terms applicable to this task are as follows:

Composite material

A high-strength glass or carbon fiber material or laminate that is wrapped around a pipe and adheres to the surface with an adhesive or resin bonding system.

AOCs associated with the performance of this task include the following:

AOC Recognition	AOC Reaction
Anomaly or other defect on carrier pipe outside the area of application.	Notify the Operator of suspected defect.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Ensure the carrier pipe surface is cleaned and prepared according to manufacturer's procedures.	Ensures proper adhesion/bonding of material to pipe surface.
2	Fill defects, as needed, according to composite material manufacturer's procedures.	Restricts flexion of carrier pipe to maintain integrity.
3	Apply composite material according to manufacturer's instructions.	Follow manufacturer's procedures for all steps such as applying adhesive, wrapping, and sealing the material.
4	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification

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	protocol, and actions required.
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Task 40.4—Install Mechanical Bolt-on Split Repair Sleeve

1.0 Task Description

This task includes installing a mechanical bolt-on repair device on an in-service pipeline. The mechanical bolt-on repair device is designed to be installed on an in-service pipeline. This type of device is considered a pressure-containing repair and can be used on a leaking defect.

This task begins with preparation of the carrier pipe pursuant to the device manufacturer's procedures, and the task ends when the bolts are tightened using the proper sequence and torque per the manufacturer's specifications.

This task does not include but may lead to the performance of other covered tasks such as the following:

- Measure Wall Thickness with Ultrasonic Meter (reference Task 8.2).

2.0 Knowledge Component

The mechanical bolt-on device is a type of pipeline repair used for covering anomalies with a full encirclement component secured onto the pipeline.

An individual performing this task must have knowledge of the following:

- Mechanical bolt-on repair devices (Type B) are designed for application on a pipeline and its flanged assemblies. The mechanical bolt-on repair device may be used as a temporary or permanent repair applied to a leaking defect. A permanent repair will require seal welding.
- The bolts used to secure the repair device must be tightened in the proper torque sequence and value to properly establish a satisfactory seal. The bolting sequence and torque must be completed according to the manufacturer's specifications.
- Bolt-on repair devices should be delivered with specifications identifying the pressure rating, material grade, and other details that must be verified to ensure compatibility with the pipeline operating pressure and service.

Terms applicable to this task are as follows:

Bolt-on repair device

A device, including sleeves or clamps, that is equipped with seals that are bolted together around the pipeline circumference to repair defects, including leaks. This type of device is available in various designs, lengths, and diameters and may be welded to the pipeline for permanent installation.

AOCs associated with the performance of this task include the following:

AOC Recognition	AOC Reaction
Anomaly or other defect on carrier pipe outside the area of installation.	Notify the Operator of the suspected defect.

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3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Prepare the carrier pipe for a proper fit of the sealing elements according to the manufacturer's instructions.	Ensures the sealing integrity of the repair device.
2	Prior to installing the device on the carrier pipe, confirm that an acceptable wall thickness has been measured in the seal welding zones if the installation is to be permanent.	Ensures that a qualified person has measured the wall thickness of carrier pipe. Ensures the integrity of the carrier pipe in anticipation of welding, if necessary.
3	Install the repair device, and tighten the bolts using the proper sequence and torque per manufacturer's specifications.	Ensures the proper location and sealing integrity of the repair device.
4	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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Task 40.5—Install Weldable Compression Coupling

1.0 Task Description

This task involves the installation of a weldable compression coupling. A weldable compression coupling is a bolt-on repair device used to mechanically connect pipeline segments, and it is installed by being clamped to the surface of a pipeline. Once attached, longitudinal bolts apply pressure to a steel ring and neoprene seal. The neoprene seal expands and provides a compressive seal between the coupling and exterior surface of the pipe.

This task begins with preparation of the carrier pipe pursuant to the device manufacturer's procedures, and the task ends when the bolts are tightened using the proper sequence and torque per the manufacturer's specifications.

The performance of this covered task may require the performance of other covered tasks such as the following:

- Measure Wall Thickness with Ultrasonic Meter (reference Task 8.2).

This task does not include but may lead to the performance of other covered tasks such as the following:

- Perform NDT—Ultrasonic Testing (reference Task 38.7).
- Perform Welding (reference Task 42.7).

2.0 Knowledge Component

A weldable compression coupling is a bolt-on repair device mechanically connected to the pipeline to provide a compressive seal between the coupling and exterior surface of the pipe as a temporary or permanent repair.

An individual performing this task must have knowledge of the following:

- Appropriate application of a weldable compression coupling device. A weldable compression coupling device is designed for application on a pipeline or flanged assembly. A device may be used as a temporary or permanent repair.
- Torque procedures.
- Compatibility of weldable compression coupling device with existing pipeline.

Terms applicable to this task are as follows:

Weldable compression coupling

A device that uses radial bolts to attach a compression coupling to the surface of a pipeline. Once attached, longitudinal bolts apply pressure to a steel ring and neoprene seal that expand providing a compressive seal between the weldable compression coupling and exterior surface of the pipe. This type of device is available in various designs, lengths, and diameters, and it may be welded to the pipeline for permanent installation.

AOCs associated with the performance of this task include the following:

AOC Recognition	AOC Reaction
Anomaly or other defect on a carrier pipe inside the area of installation.	Notify the Operator of the suspected defect.

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3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Verify the compatibility of the weldable compression coupling device with pipeline and the shelf life of the seal.	This ensures that the coupling device and seal are properly rated for the pipe being repaired.
2	Prepare the carrier pipe for proper fit of the sealing elements according to the manufacturer's instructions.	This step ensures the sealing integrity of the device.
3	Prior to installing the device on the carrier pipe, confirm that the acceptable wall thickness has been measured in the seal welding zones if the installation will be permanent.	Confirmation of the wall thickness ensures the integrity of the carrier pipe in anticipation of welding, if necessary.
4	Install the repair device, and tighten the bolts using the proper sequence and torque per the manufacturer's specifications.	The bolts used to secure a coupling must be tightened in the proper torque sequence and value in order to properly establish a satisfactory seal. This step ensures the proper location and sealing integrity of the repair device.
5	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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