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## **Task 40.6—Install and Remove Plugging Machine**

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### **1.0 Task Description**

This task involves installation and operation of a plugging machine to allow for isolation of a section of a pipeline and for removal of the plugging machine. The fitting referenced in this task has been installed by a person qualified to perform the respective task, prior to installing the plugging machine.

This task begins with the installation of the plugging machine on the valve and ends with the removal of the plugging machine from the valve.

### **2.0 Knowledge Component**

The installation or removal of the plugging machine allows for isolation of a pipeline segment or the diversion the flow on an active pipeline.

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

— A plugging machine is installed on an operating pipeline to temporarily isolate a section of the pipeline.

The plugging machine serves as a temporary block valve.

#### **Terms applicable to this task are as follows:**

##### **Completion plug**

A plug designed to seal the opening created by a hot tap. The plug will allow installation and removal of the tapping machine or plugging machine and valve.

##### **Fitting**

A component welded or clamped to the pipeline upon which a valve is installed to allow tapping and plugging.

##### **Plugging machine**

A machine installed onto a valve for the purpose of inserting a plug to isolate a pipeline segment or divert the flow.

##### **Tapping valve**

The component installed on the fitting to control product flow while inserting the boring bar and operating the cutter on the pipeline or breakout tank and during removal of the tapping machine.

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

<b>AOC Recognition</b>	<b>AOC Reaction</b>
Malfunction of or damage to tapping machine, tapping valve, or other related equipment that has the potential for loss of product.	Stop operation and secure the equipment, if safe to do so. Inspect the equipment and readjust or reset, as necessary.
Unexpected release of hazardous liquid or gas.	Stop operation and secure the equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.
Pipeline pressure exceeds the rated capacity of the plug.	Stop operation and secure the equipment, if safe to do so. Immediately notify the operator or appropriate individual. Inspect the equipment and readjust or reset, as necessary.
Inadequate supports for the plugging machine causes stress and pipeline damage.	Stop operation and secure the equipment, if safe to do so. Immediately notify the Operator or appropriate individual. Inspect the equipment and readjust or reset, as necessary.
Fire or explosion resulting from ignition of hazardous liquids or gas.	Stop operation and secure the equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.

### 3.0 Skill Component

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

<b>Step</b>	<b>Action</b>	<b>Explanation</b>
1	Install the plugging machine and other fittings and appurtenances as required by manufacturer's specifications.	This step allows for the insertion of the plug into the pipeline and for pressure equalization. This will ensure valve and fitting will maintain integrity and prevent leakage.
2	Install the appropriate support for the plugging machine, as necessary.	This step ensures that the weight of the plugging machine does not overstress the pipe.
3	Prior to opening the valve, equalize the pressure on each side of the valve if possible.	Equalized pressure facilitates operation of tapping machine.
4	Slowly open the valve fully on the fitting.	This step allows the plugging machine access to the pipe.
5	Operate the plugging machine to lower the plug into place.	Plug insertion will stop the product flow.
6	Monitor the pipeline pressure upstream and downstream of the plug.	This step ensures that it does not exceed manufacturer's specifications.
7	Confirm maintenance repairs are complete.	
8	Equalize the pressure on either side of the plug.	Equalized pressure will allow retraction of the plug.
9	Retrieve the plug from the pipe.	The plug is retracted into the plugging machine.
10	Close the tapping valve and relieve the pressure from the plugging machine.	The plugging machine is isolated from the product flow. Ensures that the tapping valve is fully closed.
11	Drain the plugging machine before removal.	Depressurize and drain the product trapped between the valve and plugging machine to ensure that residual product is not inappropriately

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		released.
12	Remove the plugging machine from the tapping valve.	Install the cap, blind flange, piping, instrumentation, or other component onto the fitting or valve per Operator's procedures.
13	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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## **Task 40.7—Install a Tap 2 in. and Under on a Pipeline System**

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### **1.0 Task Description**

This task provides the means for safely hot tapping into an operating pipeline or breakout tank. This task may or may not require the removal of a coupon.

This task starts with the installation of the tapping machine onto the tapping valve and ends with the removal of the tapping machine from the tapping valve and retrieval of the coupon, if applicable.

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

- Measure Wall Thickness with Ultrasonic Meter (reference Task 8.2).
- Insert and Remove Coupons (reference Task 10.1)
- Welding (reference Task 42.7)

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

- Install and Remove Completion Plug on Pipelines Larger than 2 in. (reference Task 40.9).

### **2.0 Knowledge Component**

Hot tapping is performed on an in-service pipeline or breakout tank to make connections without having to shut down.

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

- *The details of line segment, such as pressure, flow, wall thickness, and product, and ensures all materials (machine, fitting(s), appurtenances) are appropriately rated.*

**Terms applicable to this task are as follows:**

**Bleeder valve**

A valve that allows the controlled relief of pressure.

**Boring bar**

The main shaft of a tapping machine that turns the cutter.

**Coupon**

The piece of wall cut from a pipeline or breakout tank with a cutter.

**Cutter**

The cutter is the tool used to drill or cut a hole through the wall of a pipeline or breakout tank. The cutter may or may not produce a coupon.

**Fitting**

A component welded or clamped to the pipeline upon which a tapping valve is installed to allow tapping and plugging.

**Hot tap**

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The process of safely cutting or boring a hole into an in-service pipeline or breakout tank.

### Tapping or drilling machine

A machine installed onto the appropriate tapping valve for the purpose of boring a hole into a pipeline or breakout tank.

### Tapping valve

The component installed on the fitting to control product flow while inserting the boring bar and operating the cutter on the pipeline or breakout tank and during removal of the tapping machine.

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

AOC Recognition	AOC Reaction
Malfunction of or damage to tapping machine, tapping valve, or other related equipment that has the potential for loss of product.	Stop operation and secure equipment, if safe to do so. Inspect equipment and readjust or reset, as necessary.
Unexpected release of hazardous liquid or gas.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.
Lost coupon may damage downstream equipment.	Immediately notify the Operator.
Pressure trapped between the tapping valve and the hot tap machine.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.
Fire or explosion resulting from ignition of hazardous liquids or gas.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.

## 3.0 Skill Component

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

Step	Action	Explanation
1	Verify the proper tapping valve and fitting were installed according to applicable procedure.	This will ensure tapping valve and fitting will maintain integrity and prevent leakage during the hot tapping task.
2	Confirm proper operation of the tapping valve and that it is in the open position.	This allows insertion of the boring bar and cutter through the tapping valve bore.
3	Confirm the tapping machine rating and cutter size.	Verifies the proper machine rating on specific size pipelines.
4	Assemble the tapping machine per the manufacturer's procedures.	Assembles the tapping machine to bore the proper sized hole.
5	Prior to connecting the tapping machine to the tapping valve, make necessary measurements to determine the depth of cut.	Accurate measurement is important to ensure the tap is performed correctly.
6	Verify the operating conditions meet Operator procedures and requirements.	Ensure that pressures, level, product, or other operational parameters are as specified by the Operator.
7	Install the tapping machine on the tapping valve and ensure the cutter can pass through the open tapping valve and the tapping valve can be fully closed when the cutter is retracted.	Performing this step assures tapping valve operation and that isolation can occur before and after the tap is made.

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8	Conduct leak test.	Verify no leaks occur, per operating procedure.
9	Lower the boring bar to verify proper alignment and initial depth measurements.	Accurate measurement is important to ensure the tap is performed correctly.
10	Operate tapping machine and perform hot tap according to manufacturer's instructions.	Verify depth measurements of cutter assembly to prevent drilling through the opposite pipe wall.
11	Raise the boring bar, cutter, and pilot bit and verify depth measurements to ensure valve clearance and allow closure.	Valve closure is necessary to prevent product release..
12	Close the tapping valve.	Prevent release of product when tapping machine is removed by ensuring the tapping valve is fully closed.
13	Depressurize and drain the product trapped between the tapping valve and the hot tap machine.	Prepare for removal of the tapping machine.
14	Remove the tapping machine.	
15	Confirm retrieval of coupon, if applicable.	Provide to appropriate personnel for evaluation.
16	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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## **Task 40.8—Install a Tap Larger than 2 in. on a Pipeline System**

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### **1.0 Task Description**

This task provides the means for safely cutting a hole 2 in. and larger in an operating pipeline or breakout tank. This task will require the removal of a coupon.

This task begins with the installation of the valve on the fitting and ends with the removal of the tapping machine from the valve and retrieval of the coupon.

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

- Measure Wall Thickness with Ultrasonic Meter (reference Task 8.2).
- Insert and Remove Coupons (reference Task 10.1)
- Welding (reference Task 42.7)

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

- Install and Remove Completion Plug on Pipelines Larger than 2 in. (reference Task 40.9).

### **2.0 Knowledge Component**

Hot tapping is performed on an in-service pipeline or breakout tank to make connections without having to shut down.

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

- *The details of line segment, such as pressure, flow, wall thickness, and product, and ensures all materials (machine, fitting(s), appurtenances) are appropriately rated.*

**Terms applicable to this task are as follows:**

**Bleeder valve**

A valve that allows the controlled relief of pressure.

**Boring bar**

The main shaft of a tapping machine that turns the cutter.

**Coupon**

The piece of wall cut from a pipeline or breakout tank with a cutter.

**Cutter**

The bit that cuts a coupon from the wall of a pipeline or breakout tank. The cutter is equipped with a pilot bit to bore a hole that will center the cutter.

**Fitting**

A component welded or clamped to the pipeline upon which a tapping valve is installed to allow tapping and plugging.

**Hot tap**

The process of safely cutting or boring a hole into an in-service pipeline or breakout tank.

**Tapping or drilling machine**

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A machine installed onto the appropriate tapping valve for the purpose of boring a hole into a pipeline or breakout tank.

**Tapping valve**

The component installed on the fitting to control product flow while inserting the boring bar and operating the cutter on the pipeline or breakout tank and during removal of the tapping machine.

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

AOC Recognition	AOC Reaction
Malfunction of or damage to tapping machine, tapping valve, or other related equipment that has the potential for loss of product.	Stop operation and secure equipment, if safe to do so. Inspect equipment and readjust or reset, as necessary.
Unexpected release of hazardous liquid or gas.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.
Lost coupon may damage downstream equipment.	Immediately notify the Operator.
Pressure trapped between the tapping valve and the hot tap machine.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.
Loss of product by boring hole through opposite wall of pipeline.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.
Improper alignment may result in damage to tapping valve or tapping machine.	Stop operation and secure equipment, if safe to do so. Inspect equipment and readjust or reset, as necessary.
Fire or explosion resulting from ignition of hazardous liquids or gas.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator and execute applicable emergency procedures.

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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 proper tapping valve and fitting were installed according to applicable procedure.	This will ensure tapping valve and fitting will maintain integrity and prevent leakage during the hot tapping task.
2	Confirm proper operation of the tapping valve and that it is in the open position.	This allows insertion of the boring bar and cutter through the tapping valve bore.
3	Confirm the tapping machine rating and cutter size.	Verifies the proper machine rating on specific size pipelines.
4	Assemble the tapping machine per the manufacturer's procedures.	Assembles the tapping machine to bore the proper sized hole.
5	Prior to connecting the tapping machine to the tapping valve, make necessary measurements to determine the depth of cut.	Accurate measurement is important to ensure the tap is performed correctly.
6	Verify the operating conditions meet Operator procedures and requirements.	Ensure that pressures, level, product, or other operational parameters are as specified by the Operator.
7	Install the tapping machine on the tapping valve and ensure the cutter can pass through the open tapping valve and the tapping valve can be fully closed when the cutter is retracted.	Performing this step assures tapping valve operation and that isolation can occur before and after the tap is made.
8	Conduct leak test.	Verify no leaks occur, per operating procedure.
9	Lower the boring bar to verify proper alignment and initial depth measurements.	Accurate measurement is important to ensure the tap is performed correctly.
10	Operate tapping machine to complete hot tap according to manufacturer's instructions.	Verify depth measurements of cutter assembly to prevent drilling through the opposite pipe wall.
11	Raise the boring bar, cutter, and pilot bit and verify depth measurements to ensure valve clearance and allow closure.	Valve closure is necessary to prevent product release.
12	Close the tapping valve.	Prevent release of product when tapping machine is removed by ensuring the tapping valve is fully closed.
13	Depressurize and drain the product trapped between the tapping valve and the hot tap machine.	Prepare for removal of the tapping machine.
14	Remove the tapping machine.	
15	Confirm retrieval of coupon	Provide to appropriate personnel for evaluation.
16	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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## **Task 40.9—Install and Remove Completion Plug on Pipelines Larger than 2 in.**

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### **1.0 Task Description**

This task addresses the installation of a completion plug to tightly seal the fitting and allow installation and removal of the valve used in conjunction with a tapping machine or plugging machine. The fitting referenced in this task has been installed by a person qualified to perform the respective task, prior to installing the completion plug.

This task begins with the installation of the tapping machine on the tapping valve and ends with the installation of a cap, blind flange, piping, instrumentation, or other component onto the fitting.

### **2.0 Knowledge Component**

A completion plug is used to seal the fitting to allow removal of the valve after completion of a hot tap. **An individual performing this task must have knowledge of the following:**

- The completion plug prevents the release of product while a blind flange, piping, valve, or other component is being attached to the fitting. The completion plug can be subsequently removed from the fitting to install a plugging machine.

**Terms applicable to this task are as follows:**

#### **Completion plug**

A plug designed to seal the opening created by a hot tap. The plug will allow installation and removal of the tapping machine or plugging machine and valve.

#### **Fitting**

A component welded or clamped to the pipeline upon which a valve is installed to allow tapping and plugging.

#### **Plugging machine**

A machine installed onto a valve for the purpose of inserting a plug to isolate a pipeline segment or divert the flow.

#### **Tapping machine**

A machine installed onto the appropriate valve for the purpose of cutting a hole into a pipeline or breakout tank and installing and removing completion plugs.

#### **Tapping valve**

The component installed on the fitting to control product flow while inserting the boring bar and operating the cutter on the pipeline or breakout tank and during removal of the tapping machine.

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

AOC Recognition	AOC Reaction
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Malfunction of completion plug or tapping machine affects integrity of fitting or pipeline.	Stop operation and secure equipment, if safe to do so. Inspect equipment and readjust or reset, as necessary.
Unexpected release of hazardous liquid or gas from pipeline or completion plug.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator or responsible person and initiate applicable emergency procedures. Remove completion plug or leaking component, inspect or replace components, and reinstall the plug in the fitting.

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### 3.0 Skill Component

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

Step	Action	Explanation
1	Assemble plug and plug holder to the boring bar.	Confirms proper assembly of compatible components and the plug correctly fits the void and remains in place once installed, as well as correct retrieval and removal of the plug.
2	Inspect and assemble tapping machine and plug holder components.	Verifies components are in good condition.
3	Take necessary measurements prior to installing the tapping machine on the valve.	Confirms proper seating location.
4	Install tapping machine onto the valve with the plug holder fully retracted.	Prevents damage to tapping machine.
5	Prior to opening the valve, equalize the pressure on each side of the valve if possible.	Equalized pressure facilitates operation of tapping machine and/or valve.
6	Slowly open the valve fully on the fitting.	The valve must be fully opened to allow insertion of the completion plug.
7	Lower the completion plug into the fitting with the boring bar. Verify proper alignment and initial depth measurements.	Verifies that the plug is mechanically positioned correctly.
8	Confirm plug is properly set.	Confirms proper containment of product in the pipeline.
9	Safely relieve pressure.	Confirms proper depressurization and containment of product within tapping machine assembly.
10	Confirm plug is properly sealed.	Allows proper removal of the tapping machine, valve and installation of the cap, blind flange, etc.
11	Remove the tapping machine from the valve.	Install the cap, blind flange, piping, instrumentation, or other component onto the fitting or valve.

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

<b>Step</b>	<b>Action</b>	<b>Explanation</b>
1	Visually inspect that the completion plug is seated in the fitting.	Confirms proper alignment for correct retrieval and removal of the completion plug.
2	Verify the proper tapping valve is installed according to applicable procedure.	This confirms that the tapping valve will maintain integrity and prevent leakage during completion plug removal.
3	Slowly open the tapping valve fully on the fitting.	Verifies the tapping valve is fully opened to allow removal of the completion plug.
4	Verify clear accessibility to the completion plug.	Verify correct retrieval and removal of the completion plug.
5	Inspect and assemble tapping machine and plug holder components.	Verifies components are in good condition.
6	Take necessary measurements prior to installing the tapping machine on the tapping valve.	Confirms proper fit.
7	Install tapping machine onto the valve with the boring bar fully retracted.	Prevents damage to tapping machine.
8	Lower the boring bar to the plug.	
9	Verify proper alignment and initial depth measurements.	
10	Connect to the completion plug.	
11	Equalize the pressure on each side of the plug prior to removing the plug (if required).	
12	Remove plug from fitting.	
13	Retract the boring bar, plug holder, and plug from the fitting and tapping valve.	
14	After fully retracting the boring bar, plug holder, and completion plug, close the valve and relieve pressure above the tapping valve and from the tapping machine.	Relieve pressure and drain.
15	Remove the tapping machine from the tapping valve.	Once machine is removed, assembly is now ready for further operational tasks.
16	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.

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## **Task 40.11—Install and Remove Completion Plug on a Pipeline 2 in. and Under**

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### **1.0 Task Description**

This task addresses the installation of a completion plug to tightly seal the fitting and allow installation and removal of the valve used in conjunction with a tapping machine or plugging machine. The fitting referenced in this task has been installed by a person qualified to perform the respective task, prior to installing the completion plug.

This task begins with the installation of the tapping machine on the tapping valve and ends with the installation of a cap, blind flange, piping, instrumentation, or other component onto the fitting.

### **2.0 Knowledge Component**

A completion plug is used to seal the fitting to allow removal of the valve after completion of a hot tap.

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

The completion plug prevents the release of product while a blind flange, piping, valve, or other component is being attached to the fitting. The completion plug can be subsequently removed from the fitting to install a plugging machine.

**Terms applicable to this task are as follows:**

**Completion plug**

A plug designed to seal the opening created by a hot tap and allow installation and removal of the valve.

**Fitting**

A component welded or clamped to the pipeline upon which a valve is installed to allow tapping and plugging.

**Plugging machine**

A machine installed onto a valve for the purpose of inserting a plug to isolate a pipeline segment or divert the flow.

**Tapping machine**

A machine installed onto the appropriate valve for the purpose of cutting a hole into a pipeline or breakout tank and installing and removing completion plugs.

**Tapping valve**

The component installed on the fitting to control product flow while inserting the boring bar and operating the cutter on the pipeline or breakout tank and during removal of the tapping machine.

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

AOC Recognition	AOC Reaction
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Malfunction of completion plug or tapping machine affects integrity of fitting or pipeline.	Stop operation and secure equipment, if safe to do so. Inspect equipment and readjust or reset, as necessary.
Unexpected release of hazardous liquid or gas from pipeline or completion plug.	Stop operation and secure equipment, if safe to do so. Immediately notify the Operator or responsible person and initiate applicable emergency procedures. Remove completion plug or leaking component, inspect or replace components, and reinstall the plug in the fitting.

### 3.0 Skill Component

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

Step	Action	Explanation
1	Assemble plug and plug holder to the boring bar.	Confirms proper assembly of compatible components and the plug correctly fits the void and remains in place once installed, as well as correct retrieval and removal of the plug.
2	Inspect and assemble tapping machine and plug holder components.	Verifies components are in good condition.
3	Take necessary measurements prior to installing the tapping machine on the valve.	Confirms proper seating location.
4	Install tapping machine onto the valve with the plug holder fully retracted.	Prevents damage to tapping machine.
5	Prior to opening the valve, equalize the pressure on each side of the valve if possible.	Equalized pressure facilitates operation of the tapping machine and/or valve.
6	Slowly open the valve fully on the fitting.	The valve must be fully opened to allow insertion of the completion plug.
7	Lower the completion plug into the fitting with the boring bar. Verify proper alignment and depth measurements.	Verifies that the plug is mechanically positioned correctly.
8	Confirm plug is properly set.	Confirms proper containment of product in the pipeline.
9	Safely relieve pressure.	Confirms proper depressurization and containment of product within tapping machine assembly.
10	Confirm plug is properly sealed.	Allows proper removal of the tapping machine, valve and installation of the cap, blind flange, etc.
11	Remove the tapping machine from the valve.	Install the cap, blind flange, piping, instrumentation, or other component onto the fitting or valve.

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

Step	Action	Explanation
1	Visually inspect that the completion plug is seated in the fitting.	Confirms proper alignment for correct retrieval and removal of the completion plug.
2	Verify the proper tapping valve is installed according to applicable procedure.	This confirms that the tapping valve will maintain integrity and prevent leakage during completion plug removal.
3	Slowly open the tapping valve fully on the fitting.	Verifies the tapping valve is fully opened to allow removal of the completion plug.
4	Verify clear accessibility to the completion plug.	Verify correct retrieval and removal of the completion plug.
5	Inspect and assemble tapping machine and plug holder components.	Verifies components are in good condition.
6	Take necessary measurements prior to installing the tapping machine on the tapping valve.	Confirms proper fit.
7	Install tapping machine onto the valve with the boring bar fully retracted.	Prevents damage to tapping machine.
8	Lower the boring bar to the plug.	
9	Verify proper alignment and initial depth measurements.	
10	Connect to the completion plug.	
11	Equalize pressure on each side of the plug prior to removing the plug (if required).	
12	Remove plug from fitting.	
13	Retract the boring bar, plug holder, and plug from the fitting and tapping valve.	
14	After fully retracting the boring bar, plug holder, and completion plug, close the valve and relieve pressure above the tapping valve and from the tapping machine.	Relieve pressure and drain.
15	Remove the tapping machine from the tapping valve.	Once machine is removed, assembly is now ready for further operational tasks.
16	Make notifications per Operator procedures.	Follow the Operator's policies/procedures for appropriate documentation, notification protocol, and actions required.