
Underwater – Locate Line and Install Temporary Marker

1.0 Task Description

This task involves locating underwater pipelines utilizing sonar, probes, or water jets, etc. It also includes placing temporary markers (e.g. sonar reflectors, buoys, cane poles). This task is similar to task 14.1 (Locate Line) and 14.5 (Install, Inspect, and Maintain Temporary Marker) but contains steps or equipment that are unique to an underwater environment.

2.0 Knowledge Component

This task is performed to verify location of pipeline.

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

- Pipeline maps, mapping software, drawings, blueprints, and GPS
- Methods used to locate pipe (e.g. bottom sweep, hand probing, water probing, hand jetting, scanning sonar, gradiometer).
- Signal interference or unexpected changes in frequency and/or depth readings.
- Types of temporary markers (e.g. cane poles, buoys, sonar reflector, sonar pinger).
- One-Call notification system and One-Call laws (may vary from state to state).

Terms applicable to this task are as follows.

Pneumofathometer

A depth-measuring device consisting of an open-end hose fixed to the diver, with the surface end connected to a gas supply and pressure gauge (usually marked in Feet of Seawater or FSW). The gauge measures the pressure required to discharge water to the diver's depth.

Water probing

A line locating method in which a long, narrow instrument is connected with a hose to a pump on the surface to confirm location or measure depth of buried pipe.

Hand jetting

A line locating method in which a diver held jet nozzle is aimed in the direction of the pipeline to remove sea bottom material using a stream of water.

Bottom sweep

A line locating method in which a diver utilizes a rope or line connected to a clump weight or stationary object. Topside personnel direct the diver to move in a grid or circular pattern to determine the location of an asset or identify obstructions or terrain prior to installing an asset. This method allows divers to cover a larger area more efficiently than visually searching the seabed.

Scanning sonar

Equipment used for underwater mapping and imaging. It emits sound waves and analyzes their echoes to create an image of the sea bottom that can be used to identify exposed pipelines, existing ditches, debris, sonar reflectors, and sea bottom contour.

Gradiometer

A device used to detect variations or anomalies in the Earth's magnetic field. It can identify disturbances caused by ferromagnetic objects, such as buried pipelines.

Cane poles

A visual line marker used in shallow water. They are typically used in marshes and swamps with soft bottom consistencies.

Buoys

A visual line marker used in shallow water in which a rope connected to the buoy is tied to the pipeline or a weight that is placed directly above or immediately next to the pipeline. There are several types of surface and mid-water buoys such as foam buoys, Norwegian buoys, and milk jug buoys.

Sonar reflector pole

A sonar line marker that is attached to a pole which is inserted into the sea bottom next to the pipeline. The reflector should be located approximately three to four feet above the sea bottom.

Sonar reflector buoy

A sonar line marker that is attached to the pipeline. The buoy should be located approximately three to four feet above the sea bottom.

Sonar pinger

A signaling device that can be attached to an underwater site or instrument package. Using the pinger receiver, an instrument a diver carries, the sonar signal transmitted by the pinger can easily be detected and followed to its source.

AOCs associated with the performance of this task include:

AOC Recognition	AOC Reaction
Discovery of free-span pipeline	Notify appropriate pipeline personnel
Pipeline location does not match pipeline maps	Notify map owner and/or follow company procedure to update map.

3.0 Skill Component

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

Step	Action	Explanation
1	Determine the approximate location of the pipeline section, by using the most current drawings, maps, and/or GPS.	Drawings and/or pipeline maps are used to assist in locating the pipeline.
2	Determine method for locating the pipeline and review job requirements to determine site conditions that could affect task performance.	Topside and diver personnel are involved in this step. Locating methods are determined by the location characteristics, depth of the water, and operator procedure.
3	Check to ensure locating equipment is in proper working order in accordance with the manufacturer's recommendations.	Equipment needs to be operating properly to accurately locate pipelines. Ensure the locating equipment is properly charged and calibrated. If equipment is not working properly, stop task activities, determine cause of malfunction, and remediate per manufacturer's recommendations.
4	Use appropriate line locating equipment and/or methods to determine the location of the pipeline.	Determine pipeline location by appropriate locating method according to operator procedures.
5	Determine pipeline depth.	Locate pipeline and take pneumofathometer readings as directed by topside personnel.
6	Adequately mark the pipeline so that its location is accurately known. Temporary markers should be located directly over the pipeline.	Properly install temporary markers. When a temporary marker cannot be located directly over the pipeline, an offset marker shall be installed according to operator and state

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Step	Action	Explanation
		requirements.

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