

## Underwater – Examine for Mechanical Damage

### 1.0 Task Description

This task is to verify whether mechanical damage like dents, gouges, etc. exist on the pipeline and to ensure proper documentation and reporting have occurred. This task is similar to Task 5.1 (Examine for Mechanical Damage on Buried or Submerged Pipe) but contains steps or equipment that are unique to an underwater environment.

### 2.0 Knowledge Component

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

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Terms applicable to this task are as follows.

#### Mechanical damage

Physical damage to the metallic surface of the pipeline that, at a minimum, may include one or more of the defects listed below.

##### Buckle

A deformation of the pipe wall caused by lateral instability under longitudinal compressive stresses imposed by axial or bending loading acting on the pipe cross section.

##### Dent

A local change in piping surface contour caused by an external force such as mechanical impact or rock impact with no visual evidence of metal loss.

##### Gouge

Elongated groove or cavity usually caused by mechanical removal of metal.

##### Scratch

A thin, shallow cut or mark on the surface.

#### Marine growth

The covering of marine plants, animals, and other organisms found on parts of man-made structures that are fully submerged in the sea or intermittently immersed during the tidal cycle. Marine growth can be described as either hard or soft; and can be categorized into different levels based on the thickness of the accumulated organisms.

**Light fouling:** Marine growth thickness is less than 300 microns (0.3 mm).

**Moderate fouling:** Marine growth thickness is between 300 microns (0.3 mm) and 1 mm.

**Heavy fouling:** Marine growth thickness is greater than 1 mm.

AOCs associated with the performance of this task include:

AOC Recognition	AOC Reaction
Evidence of release; Stream of bubbles, globules of oil, oil slick, or rainbow sheen.	Discontinue the task and make immediate notifications.
Mechanical damage; scratches, dents, buckles, and gouges.	Implement mitigation measures per operator's 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	Inspect area for evidence of a release. If the inspection identifies integrity issues that are not safe, discontinue the task and make immediate notifications.	Helps ensure that the pipeline is safe for operation and continued task performance. Look for a stream of bubbles, globules of oil, oil slick, or rainbow sheen.
2	Visual or tactile inspection to verify that the pipeline surface has been prepared for the mechanical damage inspection.	Proper surface preparation is critical to identifying and locating all types of mechanical damage present on the pipe.
3	Measure and classify marine growth.	Identify hard or soft growth and the percentage of coverage using visual or tactile inspection. Measure the thickness of marine growth using a probe, soft tape measure, or other appropriate equipment.
4	Examine the pipeline to determine if mechanical damage exists.	Visual or tactile inspection for mechanical damage is critical to identify potential risks that need further assessment to avoid future leaks or failures.
5	Examine the condition of support structures.	Examine sandbags, cement bags, grout bags, anchors, concrete mats, and clamps for signs of damage.
6	Identify the type(s) and location(s) of mechanical damage. There are a variety of methods to describe the location of the damage. One of the more common methods is to locate the damage circumferentially with respect to a clock face. The location of the seam weld and the longitudinal distance to the nearest girth weld are also typically reported.	The type(s) and location(s) of the damage are used to determine later actions such as whether repairs are needed and, if so, what kind of repair is needed.
7	Document the findings and make notifications.	Follows the operator's policies/procedures for appropriate documentation, notification protocol, and actions required.