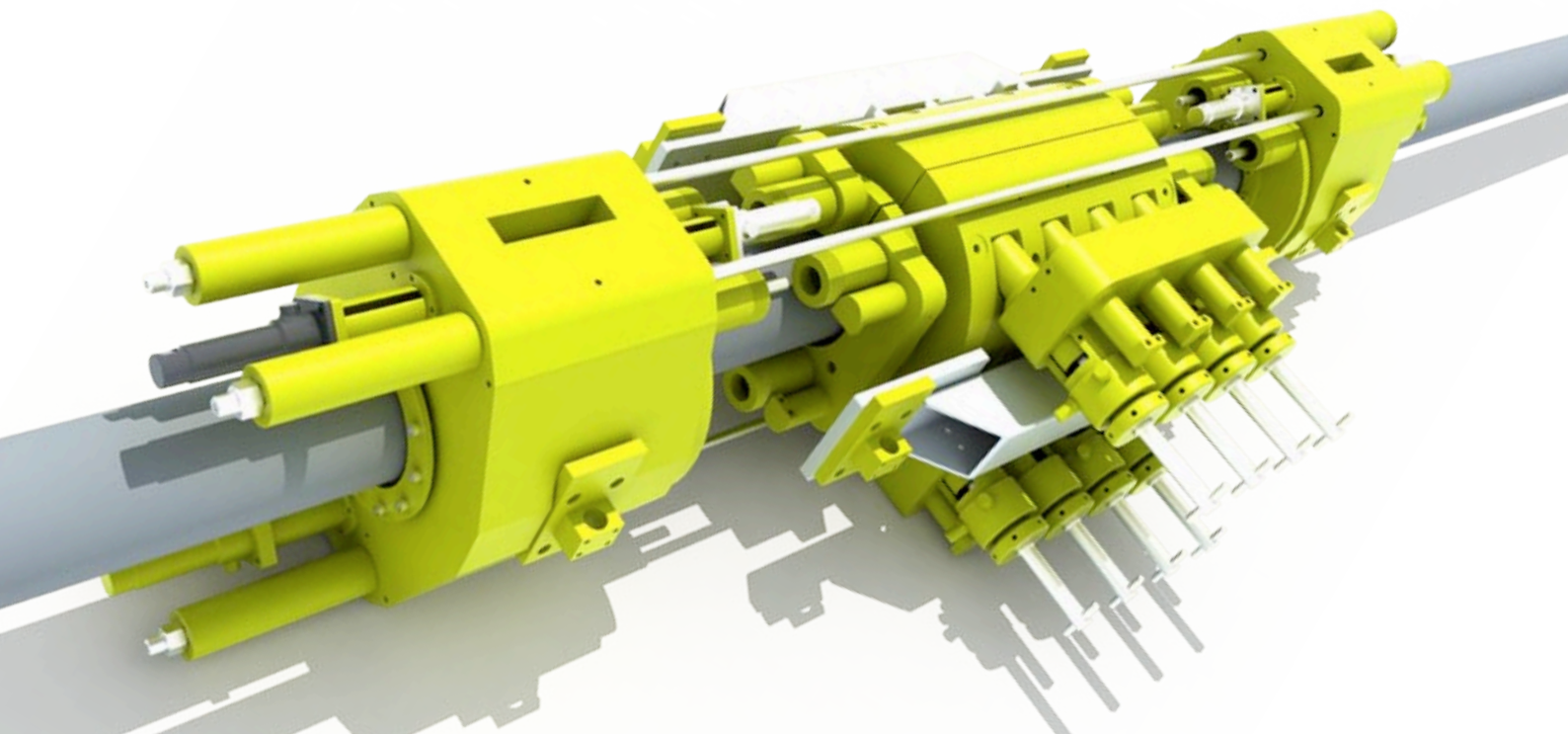




Pipeline Repair Clamps

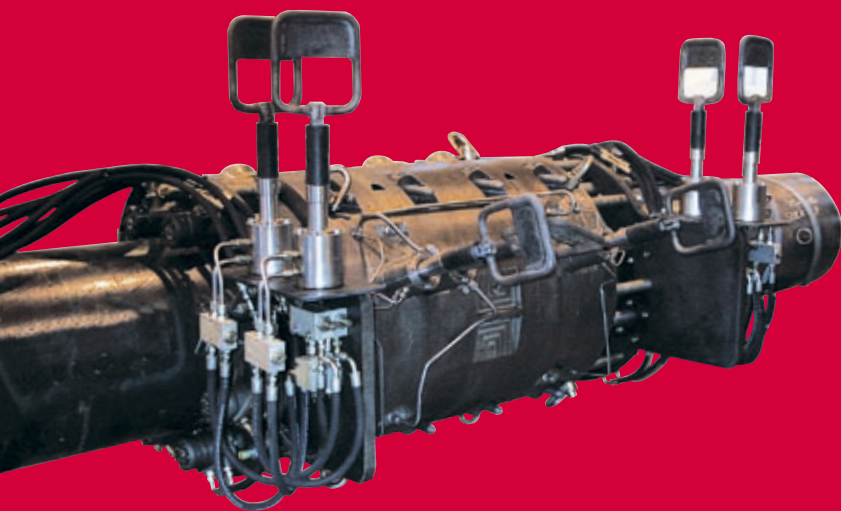
TDW Offshore Services engineers, designs and manufactures complete pipeline, riser and caisson repair solutions. Our clamp designs enable rapid manufacture, delivery and installation of clamps to fit pipeline sizes/pressure ratings that are not readily available in the market.



ADVANTAGES

The advantages that have resulted in savings for our customers include the following:

- Restoration of a pipeline's maximum allowable operating pressure (MAOP)
- Short lead times required to deliver and mobilize
- Very quick installation
- Reduced vessel, ROV and dive time
- Flexibility to fabricate clamps that are suitable for both carbon steel and stainless steel pipelines
- Reduced excavation around the pipeline or reduced need to lift the pipeline for clamp installation



20" ROV-installed pipeline leak repair clamp for a customer's crude oil pipeline with optional epoxy injection ports.



8" diver-installed flange leak repair clamp for a customer's gas pipeline.

REPAIR CLAMPS

We maintain an engineering staff that excels in the custom design and fabrication of a wide range of repair clamps. TDW Offshore's clamps can be installed by divers or ROVs, and by our technicians for topside applications. We also specialize in clamps for all diameter pipelines or clamps that require zero leak tolerance due to hazardous pipeline contents. TDW Offshore supplies these clamps with extremely short lead times.

PIPELINE LEAKAGE REPAIR CLAMPS

TDW Offshore's pipeline repair clamps incorporate two clamp halves that are fitted with seals. These halves are then closed around the leaking pipeline or the defect area to stop or prevent it from leaking.

Tensioned bolts run through the clamp halves binding the two half-pieces securely together. Longitudinal seals are then energized to stop external leakage between the two halves. TDW Offshore's repair clamps ensure a high level of sealing integrity by using multiple sealing methods.

If the pipeline has structural damage we will integrate structural modules within the system design.

ROV-INSTALLED

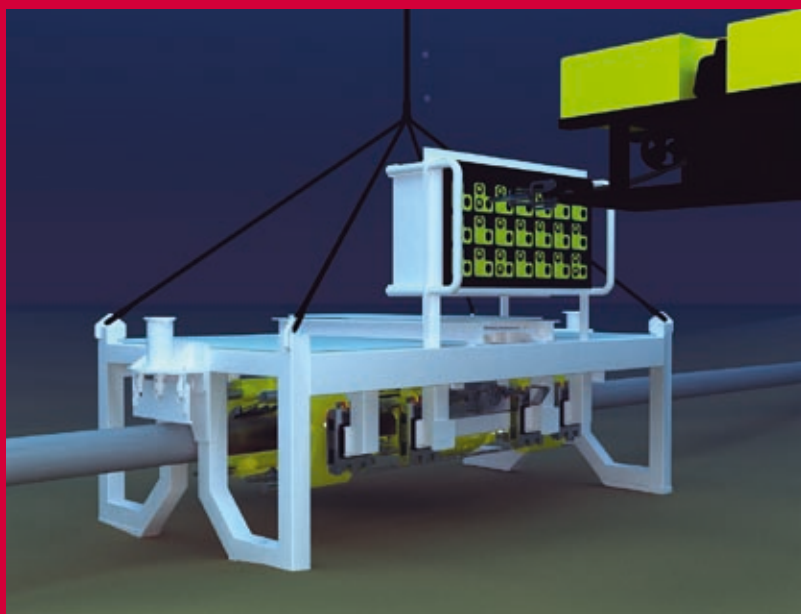
Short clamp installation times are achieved with less excavation. TDW Offshore's clamps use running tools to reduce ROV task complexity and the need for extensive access around the pipeline.

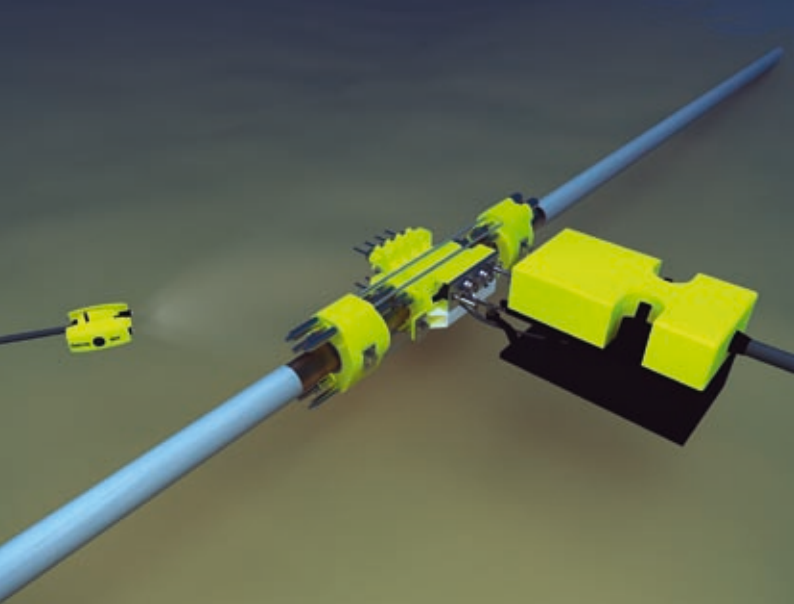
All functions of our tools are automated by making hot stab connections with API standard stabs. Automated running tools reduce vessel time required to install the clamp and reduce pipeline production downtime.

DIVER-INSTALLED

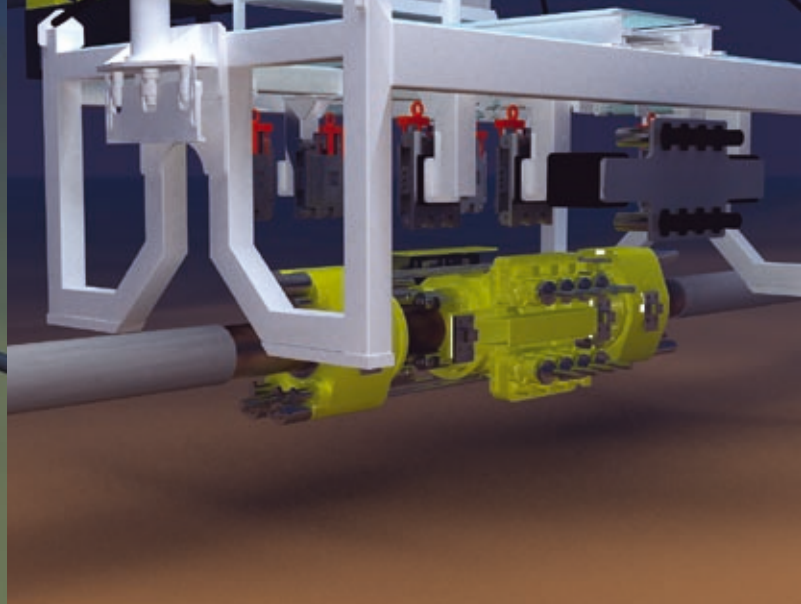
TDW Offshore designs and manufactures clamps for diver-assisted projects. Like the diver-less clamps, these clamps are designed for rapid manufacture and delivery.

A ROV-operated TDW Offshore leak/structural repair clamp is closed around a pipeline that is leaking at 2300 PSI.





Grout or epoxy is injected into a leak repair clamp.



A ROV-operated running tool for a TDW Offshore clamp is removed from the leak/structural repair clamp and brought to the surface for reuse.

TDW Offshore can engineer and manufacture clamps to meet a variety of project conditions in order to isolate all elements of a pipeline system, including:

- Flanges
- Mainline
- Branch connections

PIPELINE, RISER, AND CAISSON STRUCTURAL REPAIR CLAMPS

TDW Offshore manufactures pipeline, caisson, platform jacket and riser structural repair clamps. These are designed to restore the structural integrity of the unit in locations that are corroded or damaged. Clamps can also be designed with a pressure-retaining capacity in addition to structural improvement. The most common use of structural clamps on risers is as life extension by providing additional splash zone protection.

All TDW Offshore clamps are designed to be injected with grout or epoxy if desired. Injecting grout between the riser/pipeline and the clamp maximizes sealing and structural strength and provides a permanent repair for the operator.

Grouted riser clamps for repair in the splash zone.





TDW Offshore Services – Smart Pipeline Solutions™

TDW Offshore is the worldwide leader in tetherless, through-wall remote-controlled pipeline pressure isolation services. We minimise your pipeline downtime through fast-track delivery of project-specific pigging, repair and handling tools, both onshore and offshore.

TDW Offshore has a large in-house engineering department, allowing TDW Offshore to meet customer needs. TDW Offshore is certified to ISO 9001:2000 Quality Management System.

TDW Offshore Services is a subsidiary of T.D. Williamson, Inc. (TDW). TDW, the world's most recognized name in pipeline equipment and services, delivers safe integrity solutions for onshore and offshore applications. TDW's experts provide hot tapping and plugging, pipeline cleaning, geometry and MFL inspection, pigging and non-tethered plugging pig technology services for any pressurized pipeline system, anywhere in the world.

TDW Offshore offers a broad range of products and services, such as:

- **Pipeline Pressure Isolations**
- **Pipeline Pigging**
- **Pipeline Flood Prevention**
- **Pipeline Construction**
- **Pipeline Repair**



TDW Offshore Services

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