

Hot Tap Tool Case Study

Case Study

The era of subsea surgery is upon us: Cost-effective subsea repairs fix the ailing heart of an ageing field

The need

A client with a sick subsea tree came to us. This unwell tree had not been producing for a while, but was still costing lots of money in maintenance. They wondered if it could be fixed – and quickly.

Similar to some people, the ailing subsea tree had its problems: its arteries (hydraulic lines) and other vital organs (valves) were clogged with unwanted substances (hydrates).

To bring the tree back to productive life, the hydrates need to be removed. However, the existing cure for hydrate blockages (i.e. glycol/methanol injection and soaking) could not be implemented as an injection point could not be established.

Did they need to spend a fortune to bring the tree to the surface for repairs?

The tools

The ability to inject fluids subsea avoids the need to recover the tree to the surface – a much more expensive and time-consuming exercise.



TMT developed and built the first 1/2" version (above) of the highly specialised Hot Tap Tool (HTT) in a very short time. The tools provide fluid injection to the internals of the tree. Importantly, this is done without creating swarf or a coupon that could contaminate the line and potentially cause blockages.

For a second project, TMT was then able to successfully engineer a 6-inch model (next column). Both models can pierce the pressurised tube/pipe in-situ, like a needle on a syringe with no swarf and



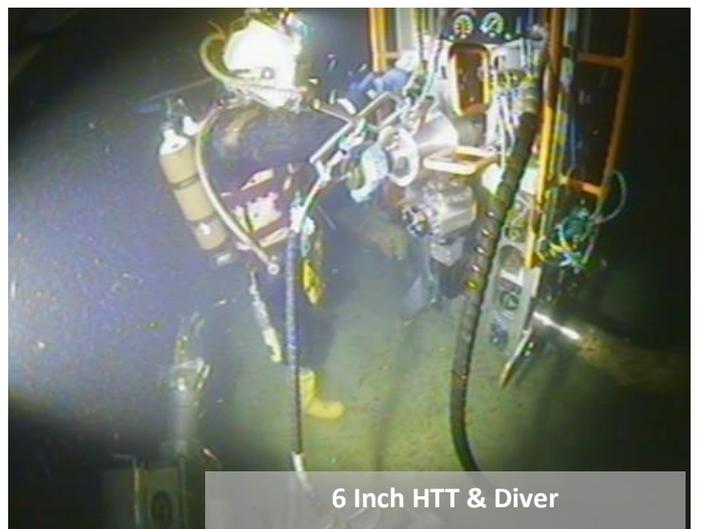
no loose coupon produced, using a simplified one-step patented tap process.

The HTT system is like a drip/infusion system to inject the required curative fluids into the ailing body.

The surgery



During the first subsea ‘surgery’ on a 1/2" line, TMT’s patented HTT established fluid injection, similar to a medical drip; hydraulic crimping tools acted like vascular clamps to stop the tree from bleeding out from compromised lines; hydraulic puller tools, like forceps, held valve stems steady during the ‘surgery’; and an ROV panel with bladder worked like an intravenous drip bag to supply and keep important fluids circulating in the tree (next page).



The route to success

Numerous engineers took part in the design, the checking and the double-checking. Fabricators and machinists worked on the prototype parts of the tools. Production team members helped ensure timely and high quality manufacturing. TMT's hydraulic technicians carried out extensive in-house testing. In the background, the finance and purchasing departments ensured that everything was adequately resourced and funded.



1/2 Inch
"Vascular Clamp"



"Forceps" Holding
Valve Stem Open

All this collective effort led to two hugely successful operations; creating moments in life to treasure.

The requirement to deliver tools at short notice seems to be the new norm. Satisfying this demand is not easy, and doing so with brand new, never-tried technology in a high risk environment is even more challenging. TMT has developed the **technical skills** and **agility** to work successfully in this new world, as this case proves.

The result

The result is very happy customers who now have productive and effective subsea assets helping to earn an income, rather than unproductive ones with high ongoing maintenance costs.



"Medical Drip" Supplying Fluids



6 Inch HTT

Our Quality

TMT's quality approach is defined by our commitment to the highest standards. Our experienced project managers and quality control personnel have in-depth knowledge of quality systems and processes. Our QA/QC processes are supported by regular inspections and audits of our workshop, subcontractors and suppliers. All inspections are carried out in accordance with project specifications and relevant standards.



Quality requirements and their management are in accordance with ISO 9001 and ISO 3834 and include:

- Document control
- Engineering change control
- Procurement procedures & inspections
- Material certificates of origin & composition
- Consumables certificates of origin & composition
- Dimensional control
- Welding procedures, qualifications & testing
- Painting procedures, qualifications & testing
- Packing & dispatch control
- 100% traceability

We believe that maintaining good communication with the client and our suppliers helps us to embed the quality message into the project and ensure that quality requirements are fully delivered.

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