CASE STUDY

M-Bubble Bridge Plug delivers outstanding 266% expansion, enabling successful water shut-off in a subsea LWI project.

PROJECT

An international operator was experiencing increased water cut from a subsea well in the North Sea and had embarked on a production enhancement programme to remedy the issue. Following the acquisition of PLT logging data, the decision was made to isolate a lower section of the well to shut-off water production, then re-perforate above. The intervention would be performed from a light well intervention vessel (LWIV) using cable deployment.

For this application, a high expansion plug was required to navigate a 3.256-inch restriction in the upper completion and set in a 7-inch, 32 lb/ft liner at a deviation of 5°, holding a differential of 1,800-psi from below, with a well temperature of 110°C.

RESULTS

DTI supplied a 2.625-inch OD M-Bubble Bridge Plug which was able to run through 4.5-inch tubing with a 3.256-inch restriction and then set in the 7-inch liner. The plug was deployed on e-line using an electric setting tool. This successfully isolated the lower section of the wellbore.

Following successful plug setting, ten perforating runs were undertaken. Firing took place just 50 feet above the plug without placing sand or cement on top to dampen the shock. The strength of the plug's seal integrity was additionally challenged when in hole equipment was set down on top during the operation.

The M-Bubble Bridge Plug delivered excellent performance throughout all operations, resulting in successful water shut-off which was verified in a later PLT logging run.

QUICK FACTS

- Water shut-off application in a subsea well.
- 2-5/8-inch OD plug successfully set in 7-inch 32 lb/ft liner.
- Ten perforating runs began just 50-ft. above the plug.
- Toolstring set down on plug.
- Sealing achieved with 1,800-psi pressure differential from below
- Water shut-off verified by PLT.

FEATURES & BENEFITS

DTI's M-Bubble plugs and packers incorporate an additive manufactured expanding metal element and are the result of four years of research and development. They offer the industry an unrivalled combination of high expansion (up to 300%), pressure rating and temperature rating and have built an excellent track record in the field.

These products have the strength and durability for serious high-pressure sealing and can isolate pressured and flowing zones in a fast and cost-effective single run.

They help to solve a range of complex plugging, sealing and isolation challenges in a variety of wells and are typically used in high ID delta applications where the tool is required to pass through narrow restrictions in the completion string then set in the casing or liner below. They are suitable for water shut off, zonal isolation, plug and abandonment and CCUS applications.

A standard UHX M-Bubble is designed for 2-1/8" OD tools and will set and seal in up to a 6-5/8" casing/liner. 2-5/8" OD tools will set and seal in up to a 7" casing/ liner. Multiple other sizes, temperatures and pressure variants are in development.

KEY FIGURES & STATS

- Unrivalled 300% OD transformation.
- In-flow, thru-tubing, high-pressure deployment.
- Applications include permanent plugging, zonal isolation/ water shut-off, cement retainer, hanger, workover and abandonment.
- Flexibility in the design of the packers, packoffs and plugs makes the range suitable for a variety of well configurations and tubing/ casing/ liner sizes.
- They are run on either slickline or electric line and set using powered setting tools or run on coiled tubing and set using flow activated running tools.