

USING COIL HOSE TO CLEAN A SUBSEA WELL

When a subsea well's screens needed cleaning urgently, the standard solution would have been to move a massive semi-submersible rig into position. But this is both expensive and slow, so a whole new solution had to be developed.



By Marie Louise Morkved

In 2016, production from a subsea well in the UK sector of the North Sea went into a severe decline. No one knew for sure why this was happening, but the well had been completed with stand-alone sand screens, and we believed these screens were being plugged with oil-based mud and/or leftover lost circulation material that had been pumped during drilling of the well.

THE CHALLENGE: FIND A CHEAPER, FASTER METHOD

An acid/breaker fluid was chosen to clean the screens – but the problem was how to get the fluid down to the formation at a depth of 9,300 feet. The normal approach in this kind of situation is to use coiled tubing on a semi-submersible rig, but this is both expensive and difficult to arrange quickly.

As both timing and cost was crucial it was important to find an alternative solution. We decided to use a coil hose, deployed from a light well intervention vessel (LWIV). A light well intervention vessel – a smaller, more maneuverable mono-hulled ship – is often used when intervening in subsea wells, but then only with wireline (electric cable) or slick line (thin wire). A coil hose is a very different thing: as the name suggests it is a hose that looks a bit like a garden hose.

“The problem with using hose is the enormous length that would need to be deployed. It needed to be about 10,000 ft long.”

THE PROS AND CONS

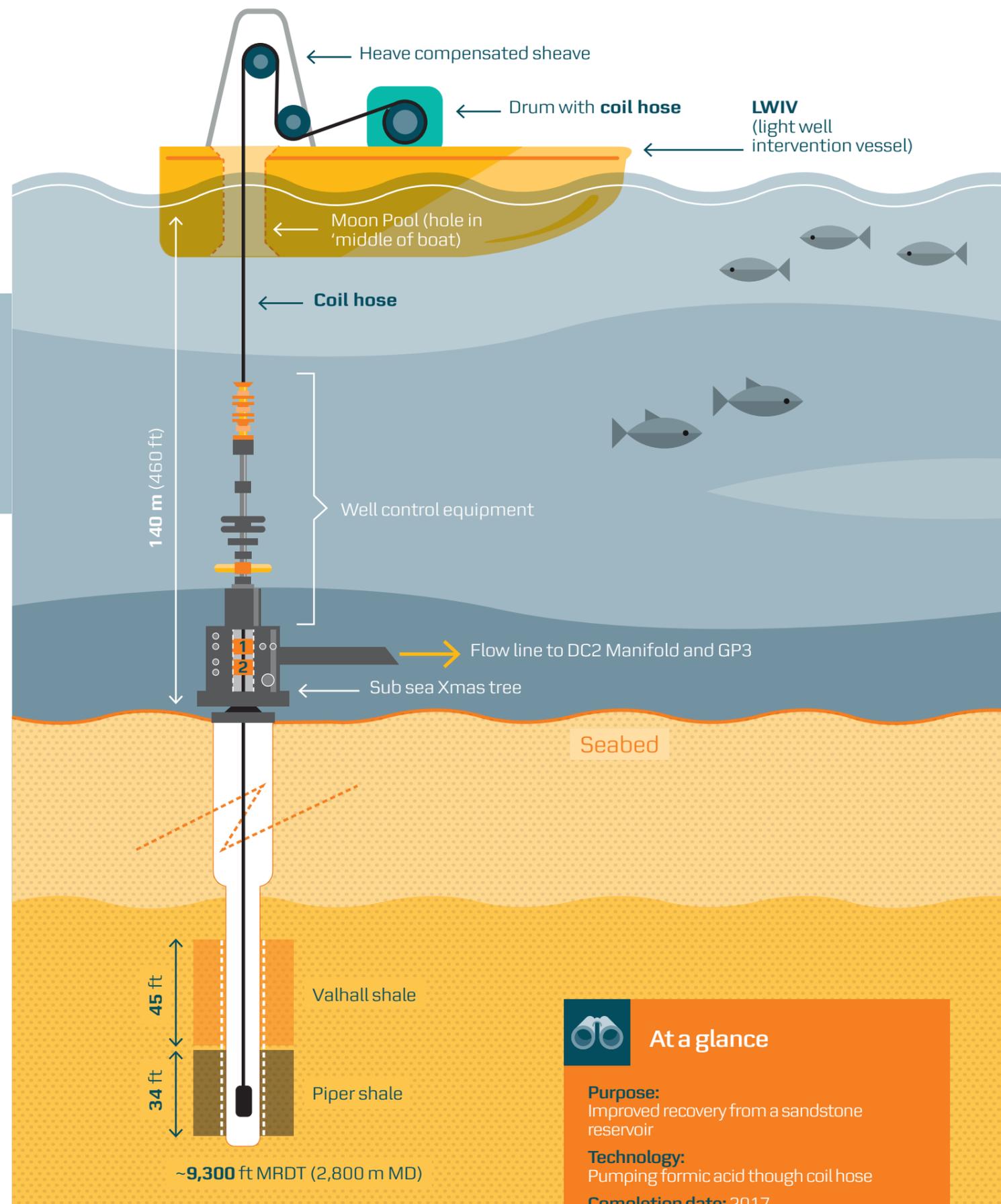
The advantage of using coil hose is that it can be rigged up using the slick line equipment and still enable pumping to take place. The problem with using hose is the enormous length that would need to be deployed. It needed to be about 10,000 feet long, and given that it has an outside diameter of 19mm (3/4 inch), the pump rate would be low even when pumping at pressures over 11,000 psi.

There were other challenges too: nobody had run a hose from a light well intervention vessel before, nobody had run it into a subsea well, and nobody had used it any deeper than 2,000 feet.

If this idea was going to succeed, several new hardware pieces had to be designed, manufactured and yard-tested. We also had to carry out numerous programme and safety reviews to ensure the job could be carried out safely and successfully. In the end the overall timing from idea to execution was just four months, a speed that was only possible due to the hard work and collaboration between the wells, asset and subsurface function in Maersk Oil UK as well as the contractors involved.

SUCCESSFUL DEPLOYMENT

The job itself went very well and without any safety incidents. Initially the production rate doubled, and even if the rate has declined somewhat over time, it is still higher than it was before the job. This result also meant that we knew for sure that the decline in production was related to screen plugging as opposed to any other failure mechanism – a valuable learning for the future management of this field. ■



At a glance

- Purpose:** Improved recovery from a sandstone reservoir
- Technology:** Pumping formic acid through coil hose
- Completion date:** 2017