

Case study: North Sea, United Kingdom

MASTODON hydraulic pulling tool rescued customer's well construction efforts

A major customer in the North Sea faced abandoning the 12 1/4-in hole section of a well and performing a sidetrack to re-drill the section after a competitor's liner hanger running tool became stuck at 6,378 ft (1944 m). The well's complicated geometry (highly deviated and corkscrew shaped) prevented rig pulling forces of 531,000 lbf (240,857 kgf) from transferring to the bottom of the well and freeing the stuck tool.

Due to the time delay of sidetracking, plus additional costs of more than \$1 million USD, the operator consulted with Baker Hughes about deploying the **MASTODON™ hydraulic pulling tool**.

The MASTODON tool pulls objects from cased wellbore using hydraulic pump pressure. It anchors in the casing, exerts a pulling force—up to 1.8 MM lbf—on the fish below, and transmits the force to the casing rather than the surface equipment. This design allows the pulling tool to be used with most conventional workover rigs and small work strings. It can be used to pull liners, retrievable packers, or any other objects that require heavy pulling strains. It also can be used with mechanical fishing tools such as an overshot, spear, or screw-in assembly.

Baker Hughes Well Intervention experts have used the MASTODON tool to pull casing in numerous well abandonment applications, and knew it could be deployed quickly with little down time and a very simple bottomhole assembly (BHA).

A ball drop sub was run, allowing circulation to the fish and a method of sealing the work string so the MASTODON tool could function with pressure. Using approximately 313,000 lbf (141,974 kgf) of pulling force, the Well Intervention team caught a short fish in an area where a failed wireline cut had weakened the pipe. A second run, using 465,000 lbf (210,920 kgf) of force, pulled the running tool, along with the debris that was wedged around it, free.

The BHA configuration used an overshot fishing tool containing a grapple as opposed to a spear, which is typically used for casing recovery. The overshot contained a grapple that gripped the fish, allowing tensile force to loosen it.

This was the first application of the MASTODON tool pulling something other than casing in mostly shallow and vertical wellbores as part of well abandonments. Considering the complicated well geometry of this well, the MASTODON tool performed flawlessly.

Challenges

- Highly deviated, corkscrew-shaped well geometry
- Getting adequate pulling force down to stuck tool
- Avoiding significant fishing operations or abandonment of the 12 1/4-in section

Results

- Pulled stuck liner hanger running tool at 6,378 ft (1944 m) through downhole force that rig alone could not provide
- Avoided having to sidetrack above the 12 1/4-in hole section
- Saved operator approximately \$1 million USD in costs



Along with the liner hanger running tool that was stuck in hole at 6,378 ft (1944 m), this piece of aluminum shoetrack was pulled out of the hole by the MASTODON hydraulic pulling tool.