

OPTIS™ MEMORY HD IMPROVING INTERVENTION OPERATING EFFICIENCY

EV's memory camera provides valuable insight to assist with complex fishing operation

TO INTERVENE OR NOT TO INTERVENE

With every well intervention comes an associated risk. This risk increases based on a number of factors including the age and condition of the well, in addition to the completion complexity. Risk versus benefit assessments determine the viability of any given well intervention.

In this case, a shifting tool had become stuck while attempting to open a sliding sleeve (2925 m). After unsuccessful attempts to free the tool, a cutter and drop bar were deployed but failed to cut the wire. Therefore, a second cutter was required before a successful cut was confirmed. This unfortunate sequence of events led to three fish (drop bar, cutter, shifting tool) and wire remaining in the well before the operation was suspended.

INTELLIGENT FISHING

Fishing is often a complex operation than can require more than a single run due to partial recovery of the fish or discovery of unexpected conditions. As this operation included multiple fish as well as a slickline cable, the customer proactively decided to include EV's high definition memory camera as part of the operation.

The first objective was to identify the depth of the top of wire remaining in the well from previous operations. This was successfully determined to be at 904 m using EV's Memory HD camera.



Figure 1: Drop bar fishing neck sitting on the low side of the wellbore and located at 1035 m



THE CHALLENGE

Following, what was expected to be, a routine intervention, a customer in SE Asia had a problem with multiple fish and cut wire remaining in hole. Locating the position and orientation of both the wire and fish were important factors to ensuring the success of the fishing operation.



THE SOLUTION

EV deployed the Optis™ Memory HD down view camera on slickline. Detailed video and images of the fish and/or wire were acquired prior to each stage of the fishing operation.



THE RESULTS

High quality, conclusive images of the fish and wire position allowed the customer to address the next phase of the fishing operation with confidence. A fishing string specific to the tool orientation was designed, saving the customer time and money, leading to a more efficient and safe operation.

GETTING TO THE BOTTOM OF THINGS

After identifying the top of the wire, approximately 255 m of slickline cable was retrieved. The next task was to locate the depth of the drop bar and cutter left in the well from the previous intervention. A single camera run successfully located the drop bar fishing neck (Fig 1) sitting on top of the side wall cutter (Fig 2). The orientation and position of each fish was established from these images which, in turn, determined the design of the appropriate fishing string. The items were successfully retrieved along with a short section of slickline cable identified on a following run (Fig 3).

A subsequent run in hole with the Optis™ Memory HD camera confirmed that the shifting tool remained stuck at the lower sliding sleeve at 2925 m. However, while initially the shifting tool could be moved, it became stuck at the upper sliding sleeve. A camera run established the fluid level to have moved up 54m and hence the customer could deduct that the lower sliding sleeve was, at least, partially open and the well could be flowed.

The position of the sliding sleeve was confirmed a few months later during a coil tubing intervention after the shifting tool had been pushed further down the well (Fig 4).

REDUCING UNCERTAINTY

Fishing operations are often complex with a high degree of uncertainty attached. During this particular intervention, the customer was faced with a number of unexpected challenges which increased both the complexity and risk.

The use of EV's Optis™ Memory HD camera throughout the operation, provided the customer with conclusive images and the downhole intelligence to be able to reduce uncertainty and make informed decisions.

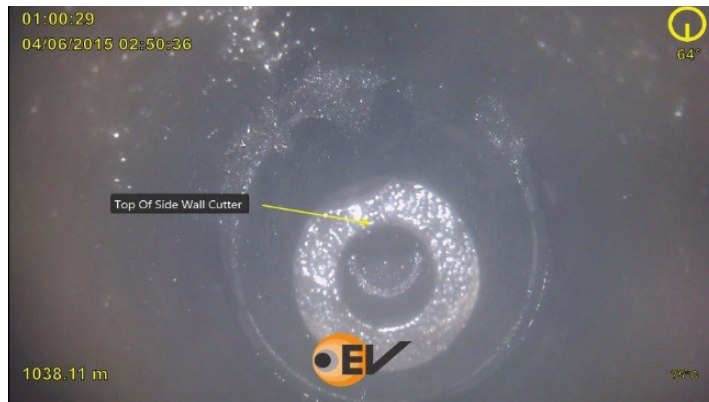


Figure 2: Side wall cutter seen centralised in the well at 1038 m



Figure 3: A short length of slickline cable located below the cutter after its successful retrieval



Figure 4: Confirmation of SSD#2 open position during a coil tubing intervention in treated sea water