

FishVA

SUCCESSFUL FISH RECOVERY FOR FRAC HIT AFFECTED WELL

EV's memory camera provides valuable insight and quantifiable data to assist with complex fishing operations

UNEXPECTED SETBACKS

Despite the successful development of Argentina's unconventional resources, many operators are being increasingly challenged with post-stimulation operational delays. Issues with wellbore access, resulting from frac hits and proppant bridges, are extending intervention schedules as additional plug mill-out and wellbore cleaning runs are required.

Pressured to deliver wells on time, operators are hastily performing remedial work with limited downhole information, risking the loss of tools downhole, well integrity - and potentially the well itself. With its market-leading Visual Analytics services, EV is helping its customers gain the necessary insight to execute corrective actions specific to their well problems, and avoid further operational downtime.

QUANTIFIED VISUAL CLARITY

The operator in Argentina experienced a complicated scenario within an unconventional well. While rectifying a section of deformed casing, a flat mill became stuck in the well's lateral section, putting a hold on completing the well and commencing production.

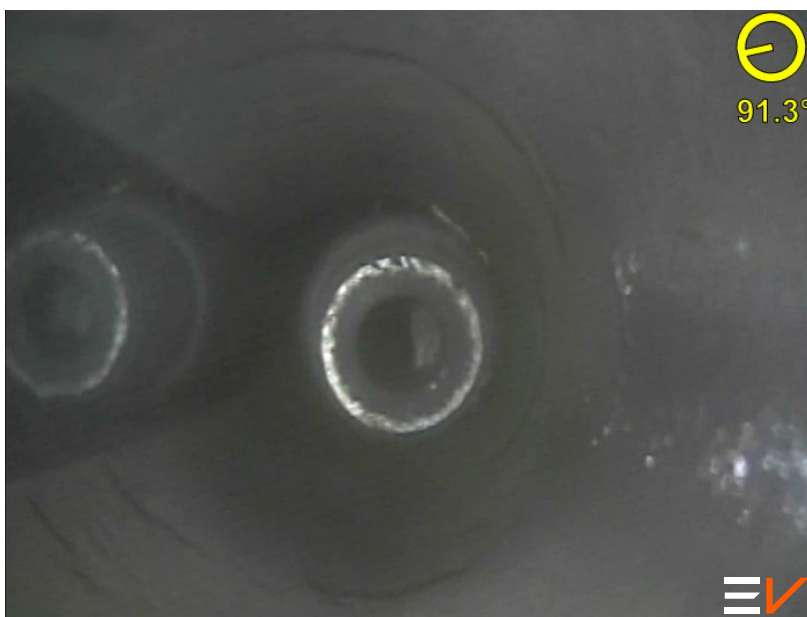


Figure 1: Image of stuck mill. The assembly is positioned on the low side of the casing (centre), while its image is reflected on the gas/water interphase located on the high side of the well

⚠ THE CHALLENGE

After having run several milling passes to rectify a collapsed casing interval, an operator in Argentina was hit with an unexpected setback - leaving a stuck mill downhole. Due to the pipe's condition and the unknown orientation of the fish, attempting to recover the mill blindly was not an option for the operator.

💡 THE SOLUTION

EV's Optis M125® camera, paired with EV's FishVA service, was deployed on coiled tubing with downview video footage acquired to provide quantitative evaluation of fish location, geometry, orientation and status. The Optis® M125 camera was provided as the ideal option, as it could be conveyed via coiled tubing into the horizontal section with the ability to circulate fluid to ensure the acquisition of clear footage.

✅ THE RESULTS

The high-definition video provided unique glimpse of the mill's position inside the collapsed casing (**Fig.1**). The real value, however, was delivered by measurements from FishVA, which provided detailed measurements of the gap between the mill and the casing (**Fig.2**), allowing the operator to customize their fishing job. With this information, the operator was able to successfully retrieve the mill on the next attempt, and complete the well for subsequent production.

The operator encountered tight access while milling plugs post frac in their Vaca Muerta horizontal well. While attempting to rectify the 4-1/2" OD casing section with suspected collapse, a 90-mm flat mill was stuck at approximately 3,700 mMD inside the well's lateral, putting a hold on completing the well and commencing production. Understanding the complexity of the downhole conditions, the operator decided to run EV's Optis[®] M125 camera on coiled tubing to ensure successful conveyance deep in the lateral, with an objective to visualize the mills' orientation in relation to the deformed casing prior to attempting a fishing run.

QUANTIFYING DOWNHOLE FISH

The acquired video footage provided crystal-clear indication of the mills' position, with the mills' threaded end sitting far closer to the low side of the hole. A reflection of the mill can be seen on the liquid/gas interphase at the high side position (**Fig.1**). It was also evident from the images that the casing section was oval-shaped, with one axis clearly longer than the other. The client suspected a stimulation-induced pressure front (aka. frac hit) may have damaged the casing, which would explain the problems trying to pass through while running-in-hole. Substantial casing wear was also evident throughout, suggesting that pipe integrity might be compromised resulting from multiple coiled tubing runs.

To get a complete understanding of the mill's status downhole, EV analyzed the video footage with its FishVA service in-situ, revealing that the stand-off on the mill's threaded end was almost 21 times larger on the high side (1.66 in.) than the low side (0.08 in.) of the casing (**Fig.2**). These detailed measurements provided the operator with the necessary information to modify an overshot and successfully recover the mill, substantially reducing operational time and cost when compared to similar operations.

HIGH VALUE SOLUTIONS

The downview footage confirmed the presence of ovalized casing and the mill's askew position within it. The real value to the customer was delivered through processing the acquired images in-situ with EV's FishVA service. In this case, the measurements provided were instrumental for the client to formulate a bespoke fishing procedure and successfully complete the well without further delays.

The quantified information provided by FishVA eliminates the risks of repeated failed fishing attempts due to unknown conditions, or false assumptions, saving operators valuable time and money.

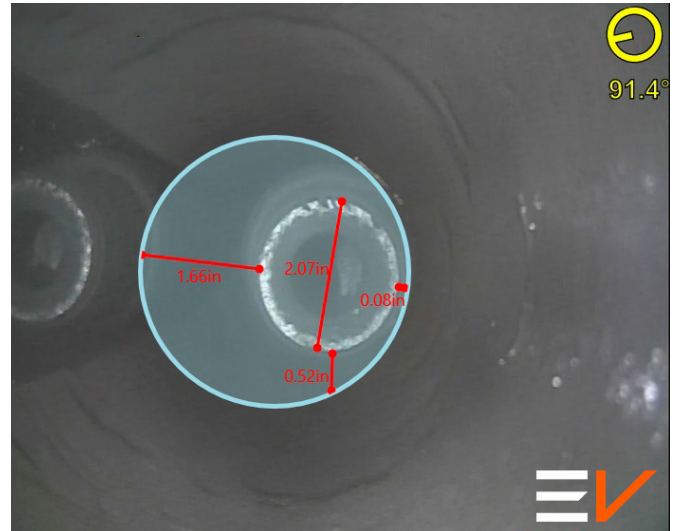


Figure 2: Image of mill post dimensioning

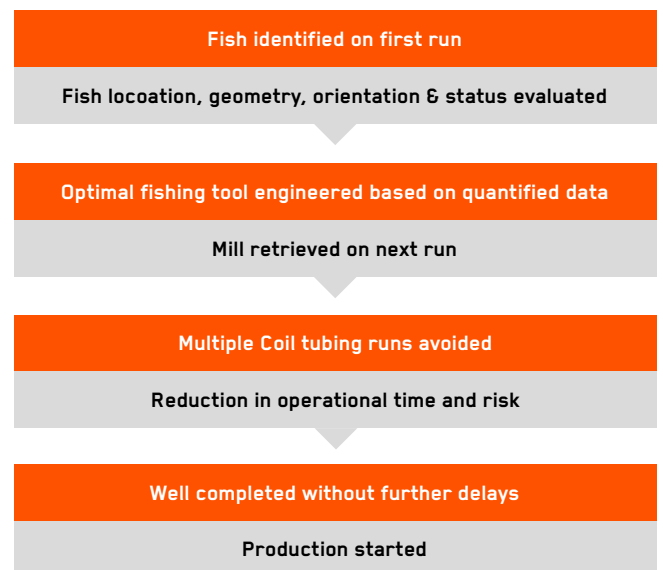


Figure 3: FishVA data helped save additional costs and delivered the well onto production faster