

VR90® X-ray diagnosis illuminates problem with stuck tubing

Downhole X-ray imaging provides dimensions and location of tubing top to guide fishing.

THE CHALLENGE

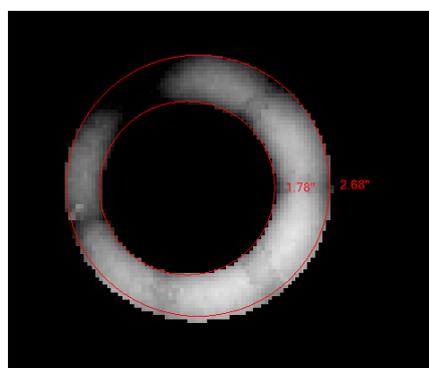
While performing scheduled maintenance on downhole production equipment in a US land well, a large independent operator encountered a section of stuck tubing. After numerous remedial milling and cutting operations, the operator was unable to pull a section or determine the cause of the sticking. A decision was made to shut in the well.

A year later while considering bringing the well back online, the operator needed to diagnose the current condition of the fish and where it was located within the wellbore. They wanted a quick and reliable solution so that they could confidently proceed with fishing the tubing and avoid rising intervention costs.

OUR SOLUTION

Visuray ran the VR90 downhole X-ray diagnostic service in the client well to evaluate the condition of the tubing. Multiple areas were inspected to both measure the current dimensions of the tubing and assess its orientation in the casing. The resulting 3D reconstructions of the tubing top showed extensive concave milling damage that reduced the outer diameter. In addition, the milling had squeezed the inner diameter such that it was preventing the onsite fishing tools from passing into the tubing.

The first image on the right shows measurements of inner and outer diameters of the tubing derived from VR90 X-ray images. The outer diameter of the tubing has been reduced from the original 2.875 in to 2.68 in as a result of the concave milling. The inner diameter of 1.78 in is also smaller than before milling.



Top of tubing with measurements

OVERVIEW

CLIENT:

- Large independent operator, US land

CHALLENGE:

- Quickly and reliably diagnose dimensions and position of the top section of stuck tubing after extensive milling.

SOLUTION:

- Use VR90 downhole X-ray diagnostic service to image top of tubing.
- Real-time images reveal tubing damaged by milling and milling debris present.
- Accurate measurements of the inner- and outer-diameters of the fish show reduced size.
- X-ray images combined with tool orientation information indicate tubing centered in well casing.

BENEFITS:

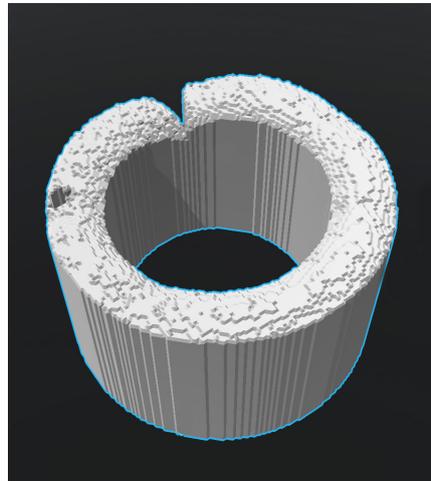
- Informed intervention planning through precise measurement of tubing dimensions and accurate assessment of condition.
- Averted cost and risk of rig time and non-productive operations.
- Quick and reliable answers without need to prepare the well by cleaning or circulating.

CASE STUDY

Client: Large independent operator, US land

The 3D reconstruction shown in the first image on the right, shows the damaged and uneven condition of the fish. Additionally, on the left side, debris can be seen that was consistent with the size of returns found when pulling out of hole.

From the illustration shown far right, the tubing was shown to be fairly centered in the casing, with no discernable angle of orientation, nor any pinching or collapsing of the surrounding casing that would have prevented it from being latched with an overshot.



3D reconstruction of tubing



Tubing in casing

CLIENT BENEFIT

After extensive intervention activities and time spent on this well, the operator required a quick and reliable diagnosis of the current condition of the tubing. As the well had been abandoned for more than a year, the opaque and debris-filled well fluid made the VR90 service the best solution. The VR90 X-ray diagnosis provided the operator with the precise size and location of the tubing top, which allowed them to confidently develop an appropriate intervention strategy.



ACCURATE. MEASURABLE. RECOGNIZABLE.

Well intervention decisions are not easy to make. The Visuray® VR90® tool offers a new commercial wireline diagnostic service that uses ground-breaking X-ray technology to give you downhole images in any well production fluid – allowing you to see with certainty and act with confidence.

Visit visuray.com/case-studies for examples.

