



CASE STUDY

THREE BARRIERS WELL INTEGRITY EVALUATION

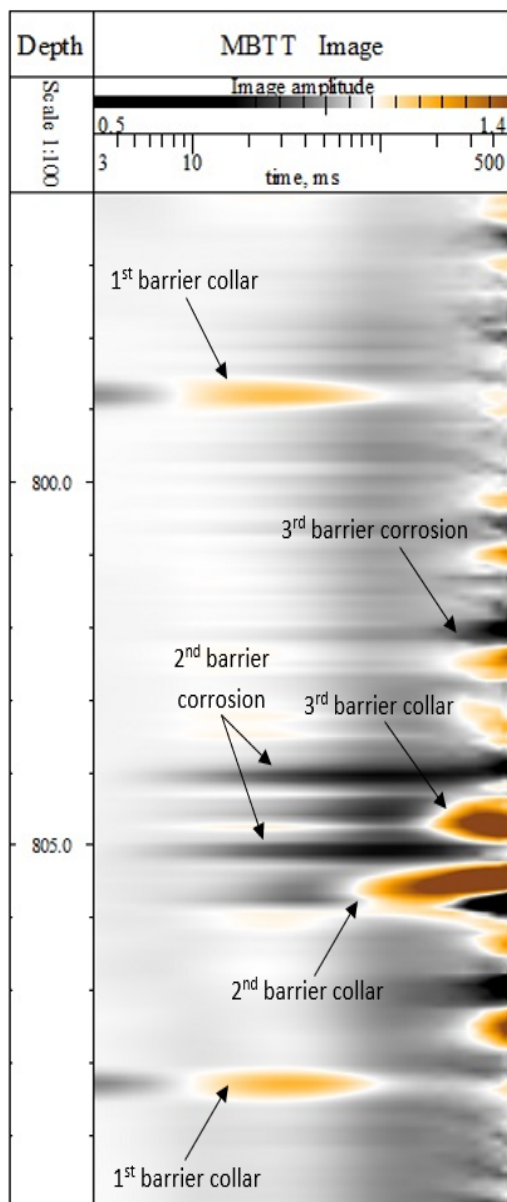
MULTI BARRIER THICKNESS TOOL (MBTT)

Location: Middle East, Oman.

Well type: vertical oil producer.

Objectives: perform a corrosion evaluation survey to identify the integrity status of the 1st, 2nd, and 3rd barriers of the investigated well.

Solution: Multi Barrier Thickness Tool (MBTT) is designed to evaluate the metal loss of the tubing and/or casing(s) and well completion elements up to 3rd barrier based on emission and measurement of an electromagnetic field with the following data processing. Fully autonomous MBTT for corrosion logging requires no preparation of the well completion, such as a scraper run. It is a stand-alone survey aimed to save time and cost for the mature well's integrity evaluation.



The calculation of the metal loss percentage of each particular pipe is based on the behavior of the most relevant EMF decay curves in comparison with a baseline corresponding to a nominal pipe thickness. The North Side in-house software allows for determining the best match between the recorded data and the calibration database coming from the real field tests. The "MBTT Image" column is the easiest way to visualize the corrosion log data for the general corrosion overview and instant quality control.

The header of the "MBTT Image" shows two scales. The upper one shows the color scale with the range of metal loss. The level of metal loss relates to changes of color palette from black color for metal loss to dark brown color for the metal increase. The header scale displays EMF decay values and allows the differentiation of time domains that correspond to a particular barrier (1st, 2nd, or 3rd).





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Major outcomes

- Overall, the 3 1/2" tubing pipes are in good condition. However, 3 1/2" joint number 18 is characterized by 10% localized metal loss from nominal.
- Overall, the 7" casing pipes are in good condition. Perforations are of good quality.
- Overall, 9 5/8" casing pipes are in good condition.

Completion equipment

- The 9 5/8" casing shoe was detected at 296.0 m.
- The 7" perforated interval was found at 1090.6-1093.6 m.
- The 3 1/2" tubing PKR revealed at 1034.7-1037.4 m.
- The 3 1/2" tubing end was detected at 1051.5 m.

