Case Study

Project: Subsea Manifold Integrity Assessment

Scope: Subsea inspection of welds and statistical analysis to estimate worst condition.

Equipment: Subsea manifold handling produced fluids.

Solution:

The potential for preferential weld corrosion in a manifold had been identified by the operator and a decision was made to carry out a subsea TOFD inspection. Sonomatic provided the subsea inspection and TOFD was successfully carried out on most of the welds and identified significant levels of corrosion. There were a number of welds where access for inspection was not possible. Since these welds were subject to similar operating conditions to those inspected it was possible to use the data obtained in a statistical analysis to estimate the expected minimum thickness and the probability of an unacceptable condition being present.

Sonomatic determined that the results of the TOFD inspection were suitable for use in an Extreme Value Analysis (EVA). This indicated that the expected minimum thickness for the system would be low and the probability of a leakage condition was approaching unacceptable levels. Replacement was therefore recommended.

Benefits:

The Sonomatic subsea TOFD provided accurate results for use in the EVA. The analysis carried out showed that there was a high probability that the remaining thickness in the welds that could not be inspected would be considerably less than the minimum measured in the welds inspected. This provided a strong case to the operator showing that the probability of leakage was approach unacceptable levels. The integrity team was able to use this to support a case for replacement of part of the manifold.

The work carried out ensured appropriate action was taken to prevent a leak (areas of very low wall thickness were found in some of the welds on removal from service). The integrity management team were able to justify the Capex needed on the basis of the strong technical case made.

Figure 1:

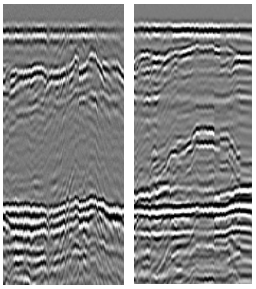

Figure 2:

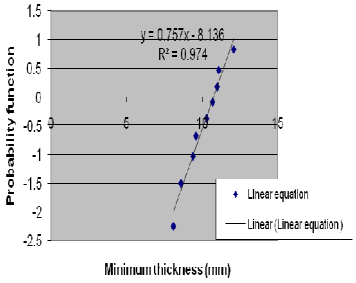

Figure 3: