

CASE STUDY

TARGETED INSPECTION OF CRA WELDS ON WATER INJECTION FLANGED FLOWLINES

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INTRODUCTION

A pinhole leak was seen in a flange weld on a 12" Water Injection Flowline at 500m water depth. The pipe and flange were carbon steel API 5L X60 with internal CRA (Inconel 625 Corrosion Resistant Alloy) cladding and the butt weld was also CRA (Inconel) welded. The requirement was to develop inspection techniques to examine similar (10" and 12") CRA welds/HAZ and the parent material either side for possible corrosion.

PROCESS

As the external weld profile had a short land area on the flange side with very limited access to the flange (due to the proximity of the flange bolts/studs), existing probe/scanner solutions were restricted. CRA welds have limitations for ultrasonic inspection due to the variable grain boundaries. The inspection tool was also to be ROV deployed.

The Sonomatic ROV-iT has had extensive use at this water depth, but in its standard form, was not suitable to gain access under the flange bolts. The tool was redesigned to allow the probe arrangement to extrude from the frame and gain access to the welds for inspection.

The inspection methodology was to apply multiple angle shear wave inspections from both sides of the weld in one deployment with full coverage (360°) of the weld and TOFD for defect confirmation and sizing when required.

The full system was validated on mockup samples prior to mobilisation to demonstrate the POD and accuracies of the system.

OUTCOME

Without this novel inspection technology being utilised, these welds were un-inspectable, and could have caused significant unscheduled shutdowns and lost productivity. The inspection performance (accuracy & POD) delivered was critical in allowing the client to continue safe operation of the pipelines. This together with ROV deployment, reduced the time, and costs to complete the inspections.

INSPECTION OF FLANGE WELD:



ROV-iT DEPLOYMENT TO SITE:

