



Corrosion mapping

Case
study

Corrosion mapping of line pipe

Corrosion mapping is an ultrasonic technique which maps and identifies variations in material thickness due to corrosion. Corrosion is the deterioration of a metallic material by chemical (or electrochemical) attack.

To perform corrosion mapping an automatic or semi-automatic scanner is used to scan an inspection surface, using various ultrasonic techniques including pulse echo A-scan and phased array.

Corrosion mapping is widely used in the oil, gas and nuclear industries for the inspection of pipework, pressure vessels, storage tanks and reactors. In the Aerospace sector, corrosion mapping is often referred to as 'C-Scan'

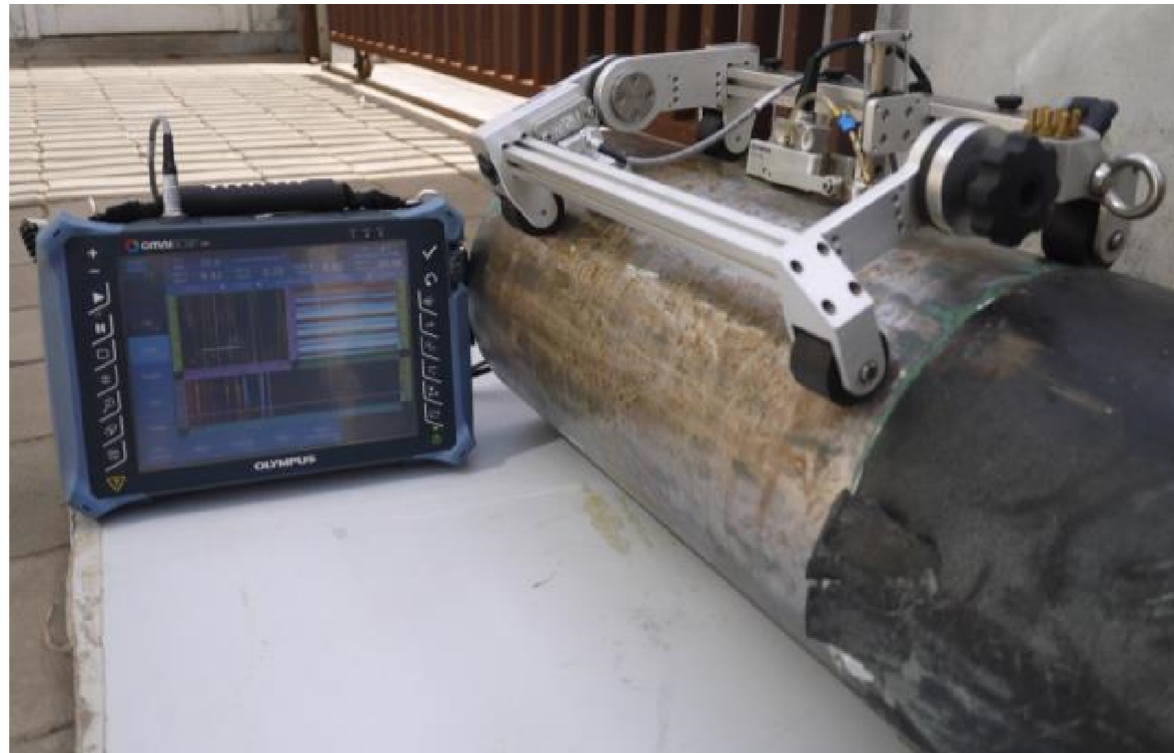
Job details

- Line pipe sample 271mm diameter x 6.65 mm thickness x 1500mm long



Equipment used

- Olympus – MX2
- Technique – Phased array
- Probe – 5L64
- Wedge – Normal (0°)
- Scanner – HSM T



Aim

- To simulate the grooves in piping in longitudinal and circumferential direction and estimate the depth, length (along the length of pipe) and width (along the circumference of pipe) by PAUT



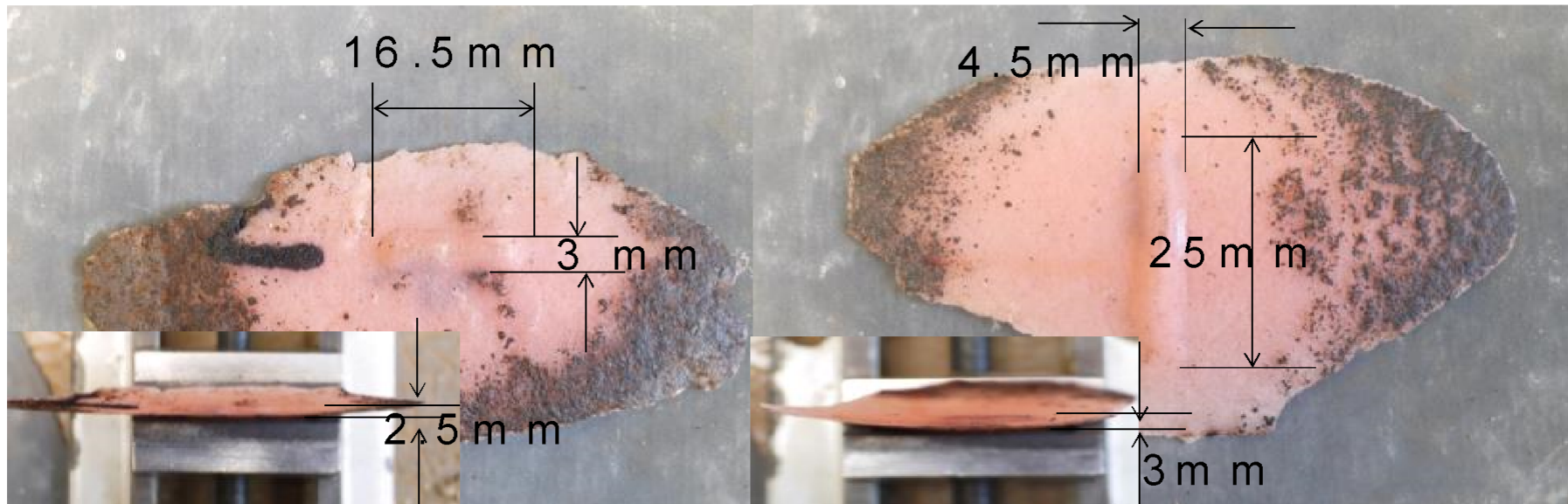
Longitudinal groove



circumferential groove

Measuring groove dimensions

- Groove dimensions were measured by taking up replication of groove



Longitudinal groove

Circumferential groove

Results longitudinal groove



Results circumferential groove



Comparative study

Parameter (longitudinal groove)	Flaw size by measuring mould using vernier calipers	Flaw size by PAUT
Length	16.5 m m	16.21 m m
Width	3 m m	2.5 m m
Depth/height	2.5 m m	2.0 m m
Parameter (circumferential groove)	Flaw size by measuring mould using vernier calipers	Flaw size by PAUT
Length	4.5 m m	4.1 m m
Width	25 m m	25.8 m m
Depth/height	2.5 m m	3.0 m m