

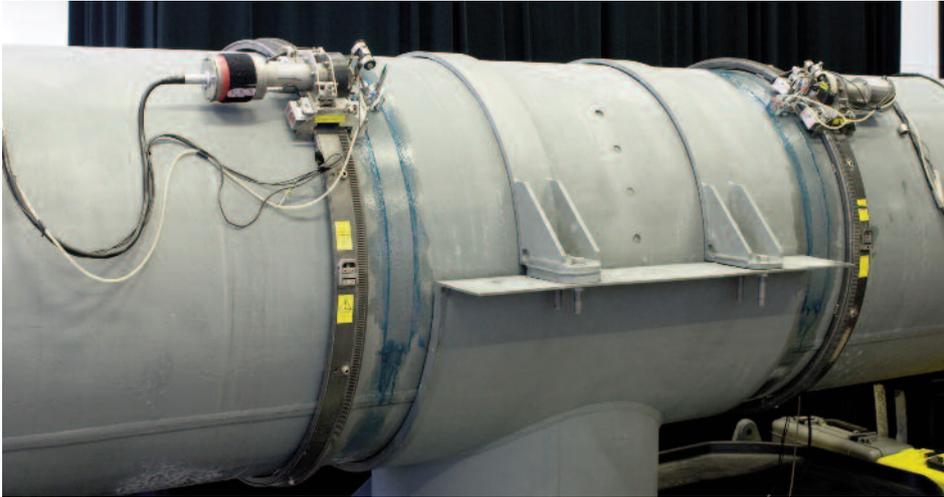
Multiskip Inspection

There are many situations in which in-service degradation can affect areas that are not readily accessible for direct inspection. Examples include pipe and vessel supports where external corrosion is often a threat. Lifting pressure equipment from supports is costly and potentially hazardous hence there is a growing need for inspection techniques that provide information on the condition of material in inaccessible areas. The Multiskip technique has been developed to address this need. It provides a high probability of detection for corrosion type damage under pipe and vessels supports and also allows estimation of the depth of corrosion.



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Sonomatic has offices in strategic global locations so we can respond quickly to customers' requirements wherever they may be situated. Our high quality products are matched only by our customer service. In addition to our field services, we offer training and consultancy at our sites in the UK or at clients' premises anywhere in the world. Sonomatic is committed to improving asset performance through applied and innovative technology; to delivering these benefits to our customers in the products and services that we provide; and to working with our customers, as value-added partners, to realise the maximum benefits of inspection technology.

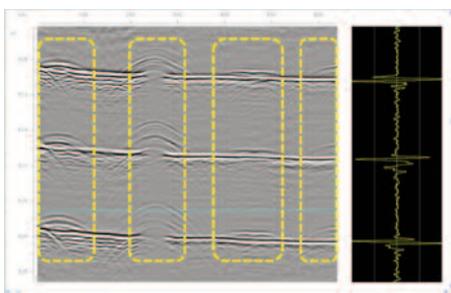


Multiskip can be used on both pipes and plate, and is suitable for inaccessible geometries such as clamps, saddles and pipe supports. This eliminates the need for expensive shutdown and lifting of equipment by providing information that allows integrity decisions to be made. Sonomatic offers a full service to customers in carrying out Multiskip inspections for a range of situations.

The Multiskip technique uses angled shear waves with two transducers in a pitch-catch mode. The transmitter and receiver can be separated by up to 2 m with full investigation of the material condition between the probes. The data can be collected while scanning at reasonably high speeds, allowing for rapid coverage of large areas.

The transmitting ultrasonic probe injects ultrasound into the material. This sound then 'skips' through the material to be received by the second ultrasonic probe. The arrival time for each of the skips depends on the distance between the ultrasonic probes and the thickness of the material.

Any degradation present along the beam path affects the arrival times for the signals. The characteristics of the data are readily visible in the b-scans generated as the data is collected. Review of the b-scans allows clear identification of the presence of degradation. The figure below shows the responses over a test pipe containing a number of regions of localised wall loss (these are highlighted in the yellow boxes). The technique is also capable of identifying areas of more general wall loss.



In the case of localised degradation the data is analysed to estimate the depth of flaws. In the case of general degradation the data is analysed to estimate the average remaining wall thickness.

A number of independent trials to assess the Probability of Detection (POD) of the technique have been performed (CHRIS, GSP 235 and HOIS). These consistently show a high POD for the technique applied to corrosion related degradation. This makes the technique particularly suited for compliance type inspections where the requirement is to validate that there is no degradation of any concern present.

The technique can be employed with either an axial beam (circumferential scanning) or a circumferential beam (axial scanning). The axial beam inspection requires an automated scanner while circumferential beam inspection can be accomplished with a simple manually deployed scanner.

This technique offers the following.

- Large area, single pass corrosion detection
- Depth sizing capability for corrosion
- Probe separation up to 2 m
- 100% coverage of material between the Probes
- Suitable for steel pipes and plate
- Sensitive to both internal and external surface degradation
- Ability to inspect material thickness between 3mm and 100 mm

QA and HS&E

It is Sonomatic's ongoing commitment to supply services and products, through the application of technical and engineering excellence, which complement both the customer's and our own QA and HS&E requirements.

Sonomatic's commitment to quality is maintained through continuous assessment and review of our Quality Management Systems to BS EN ISO 9001:2008. Sonomatic actively promotes the development, implementation and improvement of our QMS as a part of our ongoing drive to enhance customer satisfaction by meeting or exceeding customer requirements. In 2009 Sonomatic achieved UKAS accreditation as an Inspection Body to BS EN ISO/IEC 17020 (UKAS IB4276).