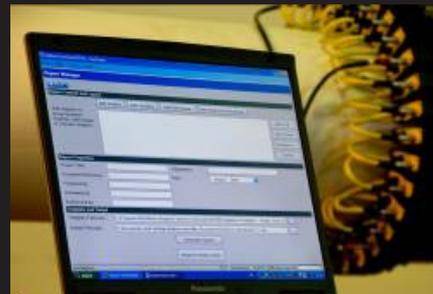


Integrated Teletest® Long Range Ultrasonic Inspection Service from Sonomatic



Long Range Ultrasonic Technology (LRUT) has been used widely in the field for a number of years. As a screening tool it has proven to be effective and it is gaining in popularity. There has, however, been a trend towards 'commoditisation' of the technology and it is sometimes inappropriately applied. We avoid these problems through an in-depth understanding of both the underlying technology and the integrity requirements driving the need for inspection. Our LRUT inspection service is unique in forming part of a wider package aimed at effectively addressing the clients' integrity needs

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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.

Our Philosophy towards LRUT is as follows:

The technology is a screening tool, and as such, it does have limitations. The sensitivity for most applications is generally quoted as 5% loss of cross-sectional area. This could mean in the case of a 300mm diameter pipe with a wall thickness of 10mm:

- 0.5mm uniform wall loss, or
- 100% wall loss over 50mm of circumference

In the case of localised corrosion the minimum detectable wall loss is potentially quite severe and significant flaws could go undetected. However, when used in the context of a screening tool, it provides a level of inspection over large areas of pipe which would otherwise have major cost implications, these being:

- Extensive scaffolding/excavating/de-lagging and cleaning for thorough inspection
- More frequent pipeline replacement to avoid risk of failure (replacement cost and associated downtime)
- Do nothing and run the risk of plant failure with associated safety/environmental implications, downtime and emergency repair costs.

When used properly, LRUT flags up areas showing corrosion activity which require further investigation. This does not necessarily stop at the specific location(s) of the indication(s) detected, but it triggers a higher level of investigation. For instance, if indications are detected in sections of straight pipe, adjacent elbows or other fittings may warrant inspection using a complementary technique.

The process adopted by Sonomatic is as follows:

a) Carry out the LRUT 'shot' at the prescribed location using the Pi Teletest® system. The latest versions have advanced on-line reporting requirements which require the file headers to be completed and initial analysis of data to be completed before the operator is permitted to set up the next shot. This means that reports are completed as the work progresses. At the end of each shift the reports can be printed out.

b) An evaluation follow-up team accompany the Teletest® crew. The crew is equipped, where necessary, with:

i. TOFD Screening - This is a rapid mechanism for corrosion mapping of large areas. It is not as fast as LRUT, and it requires access to all external surfaces. The lateral resolution is not as good as a conventional corrosion map, but the through-wall resolution of measurement (and hence monitoring capability) is very good.

ii. CHIME® - a semi-quantitative tool provided under license from the HOIS R&D Club. CHIME® inspects pipe material located between two UT probes which can be up to 1m apart. This is ideal for pipe supports. LRUT indicates only where there is an indication. CHIME® classifies indications into categories of:

- No corrosion.
- <10% wall loss
- 10% to 40% wall loss
- >40% wall loss

Sonomatic have made a number of developments to improve the accuracy and reliability of measurement in the 10% to 40% wall loss range.

iii. Multiskip Pulse Echo - This is a shear wave pitch-catch technique in which the material in between two probes separated by up to 1 m is inspected for general and localised wall loss. The technique is complimentary to CHIME® and the two approaches are often used together. It can offer improved sizing for certain types of defects. Sonomatic are leaders in developing field application of this technique.

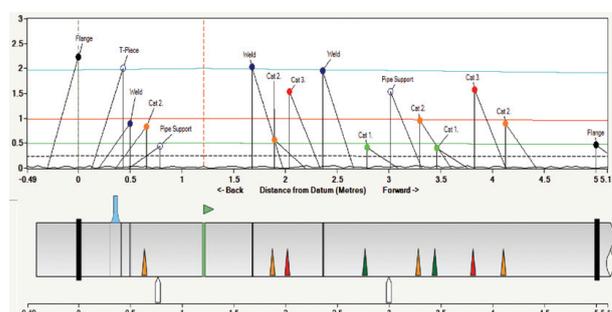
iv. Corrosion Mapping - The Sonomatic Micromap or Nautilus systems are used to generate high resolution corrosion maps. These can accommodate any geometry of component including elbows, reducers, valves, Tees, manifolds, headers, etc which cannot be effectively covered by LRUT. The corrosion maps can be output in a format used to generate CAD, and hence FEM models to simulate the stress distribution around the corrosion morphology.

v. Weld Inspection - Sonomatic were the pioneers in the use of TOFD for industrial applications. We remain at the forefront of this technology and it is the mainstay of our business. Our technical staff have a working knowledge of the requirements for Fitness-For-Service assessment and generate reports which are meaningful in this context.

The approach adopted ensures that (i) there is clear feedback to the client's integrity team when lines are found to be free of degradation and (ii) areas of degradation are followed up with a level of action appropriate to providing assurance of ongoing integrity.

Conclusion

Our services can be more expensive, when day rates are compared, than those available from others who offer LRUT as a commoditised product, but we deliver meaningful data that is quickly interpreted and analysed to assist integrity decision making. The true value resides in the way in which the inspection approach allows clients to effectively understand and manage the risks associated with safety and business critical equipment.



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).