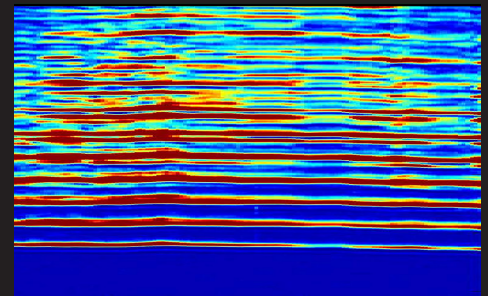


CHIME® Inspection



All owners and operators have a requirement to extend the useful life of their plant, and the early detection of corrosion and cracking is a significant consideration in the long term management of equipment integrity. There is often a requirement to inspect large areas, such as on separator vessels or long pipelines and achieving the desired coverage using conventional ultrasonic approaches can be time-consuming and costly. In addition, inaccessible regions such as pipes on pipe supports or under clamps generally cannot be inspected unless the entire assembly is dismantled, often involving expensive shutdowns and significant effort and cost. The CHIME® technique solves these problems by offering large area, single pass screening, which inspects the full volume between the probes (which may be separated by up to 1m).

CHIME® is a registered trademark of ESR Technology Ltd in the European Union and the USA.

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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.

CHIME® 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 but provides sufficient information to indicate areas of corrosion, thereby allowing for effective decision-making in ensuring long term integrity of equipment. CHIME® offers a very efficient approach for initial screening, in which regions where degradation is identified can be followed up with detailed wall thickness mapping. Sonomatic offers a full service to customers in carrying out CHIME® inspections for a range of situations.

CHIME® was developed within the HOIS joint industry project. It has been proved successful in field trials in upstream and downstream applications, and is now gaining in acceptance in all kinds of plant, especially for rapid, large area screening for sites of corrosion. The system employs a combination of ultrasonic head-waves and creeping waves, hence its name:- Creeping Head-wave Inspection Method.

Bulk, creeping and head waves are generated using a piezoelectric transducer mounted on an angled shoe. The complex mode of propagation provides complete inspection of plate or pipe, effectively utilising the internal and external surfaces as a wave guide which creates little attenuation. The basic CHIME® technique involves discrete transmitter and receiver probes separated by up to 1m operating in through-transmission. A series of characteristic responses are detected by the receiver, typically grouped separately as BULK and CHIME® waves. The spacing of these signals is determined by the material thickness. The geometry of corroded surfaces affects the amplitude and characteristic pattern of the received signals.

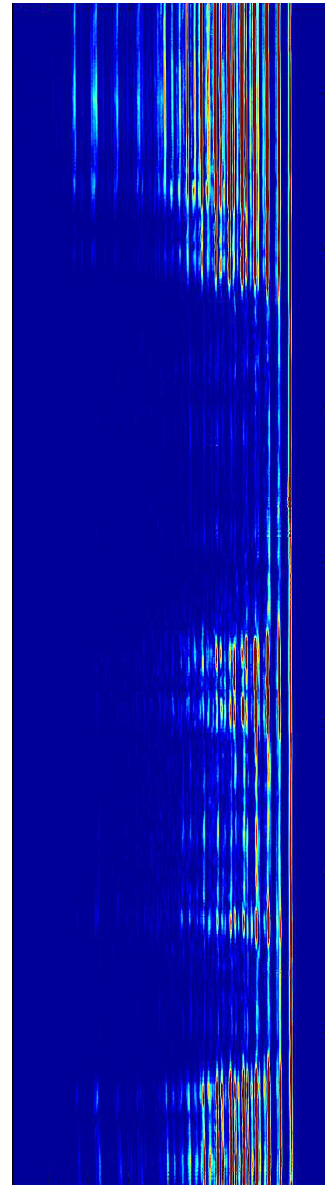
The effects become more pronounced with increasing depth of corrosion and it has been possible to apply a qualitative ranking of signals into the categories of <10% corrosion, 10% to 40% and >40%.

Sonomatic have carried out development work to enhance the technique. The enhancements include use of pulse echo modes to provide additional information for defect characterisation and application of advanced digital signal processing of the data to aid interpretation.

The technique has been shown to be effective in meeting the requirements as a primary technique for Non-Intrusive Inspection (NII) of certain types of pressure equipment. It is being used increasingly by Sonomatic in this application and we can assist clients in identifying when and how it can be used in this role.

This ultrasonic technique has the capability for high coverage inspections of pipe or plate and can also be applied to the inspection of under-clamp or under-support corrosion:

- Large area, single pass corrosion, pitting and crack detection
- Probe separation up to 1 m
- 100% coverage of material between the probes
- Suitable for steel pipes and plate
- Sensitive to both internal and external surface degradation
- Signal response gives information on defect severity
- Tolerant to typical field surface conditions and thin coating
- Recommended for wall thickness - 6 to 100 mm
- Pipe diameters from 4" upwards



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).