



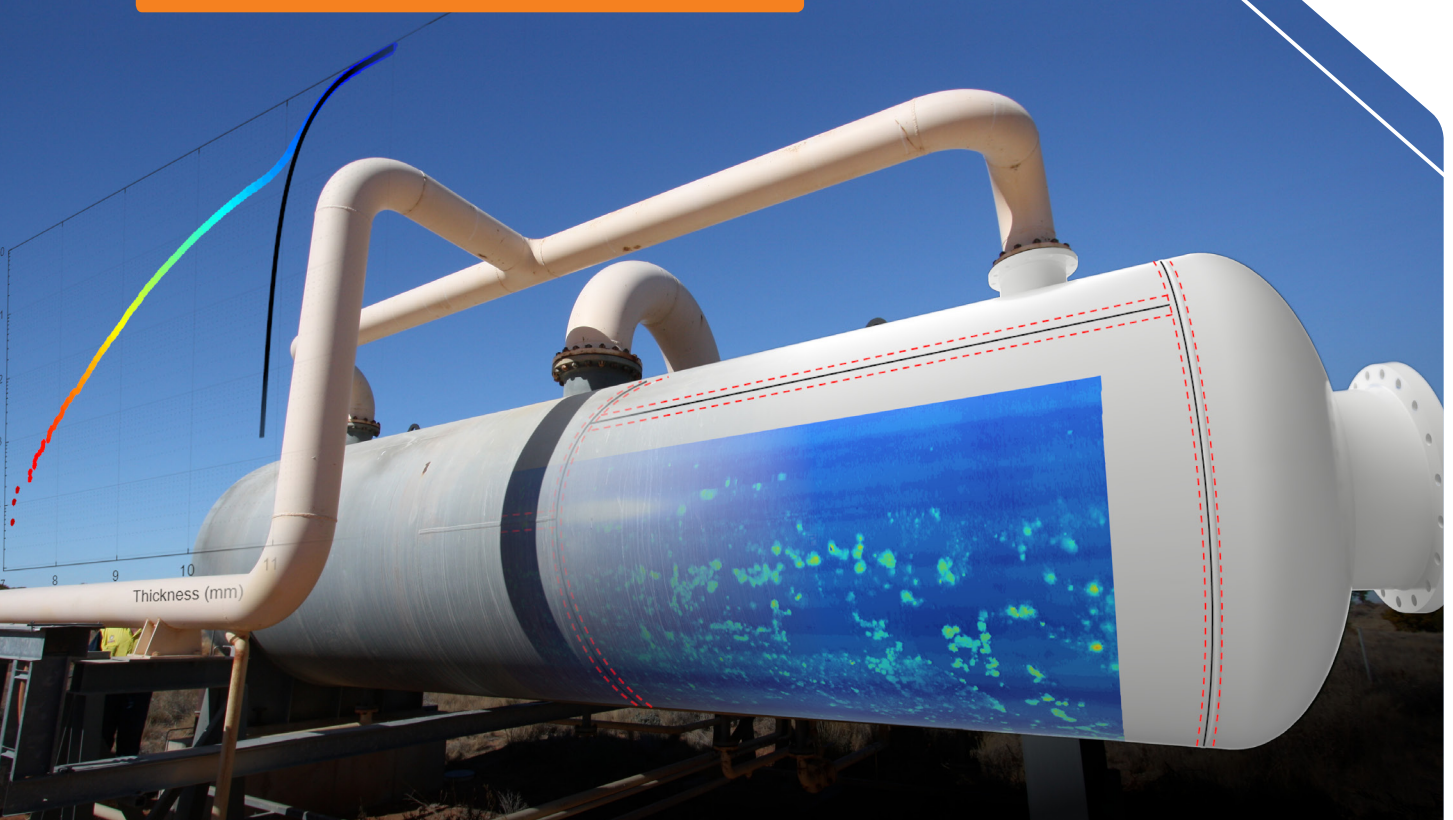
SONOMATIC

CAPABILITY STATEMENT

INTEGRITY SERVICES

THE PURPOSE

This document is composed to assist our clients and the supply chain to understand our group operating structure along with a high-level understanding of the benefits, services and specialist packages associated with our integrity and engineering capabilities.



WHO WE ARE



The CWL Group is an international consortium of companies that delivers a comprehensive range of asset integrity, inspection, maintenance and specialist access services across a wide range of industries and sectors.



Sonomatic is a subsidiary of the CWL group specialising in the design, development and application of Non-Destructive Testing (NDT) inspections. Since the company's formation in the 1980s, we have combined these NDT processes with integrity engineering capabilities to provide fully integrated inspection packages that directly meet the needs of the client.

Bringing innovative bespoke inspection solutions to the market through in-house development of equipment, software and robotics, Sonomatic resides as the global leader for ROV-deployed subsea inspection and Non-Intrusive Inspection (NII) technologies.

Our team is committed to providing accurate, proactive inspection and engineering solutions that enable clients to manage the integrity of newly constructed assets and make informed decisions crucial to the safe continued operation of maturing ones.

GLOBAL FOOTPRINT



WHAT WE DO

Sonomatic provide integrity engineering and NDT services at every stage of a project's life cycle. NDT subject matter experts assess each scope of work individually to ensure that the inspection solution(s) will meet the desired deliverables. If a unique solution is required, our R&D department can design and manufacture inspection technologies and scanners that will exactly meet our client goals. Our integrity service offerings provide industry leading inspection and engineering evaluations of the inspection data to enable recommendations for repeatable inspection programmes.

SUBSEA



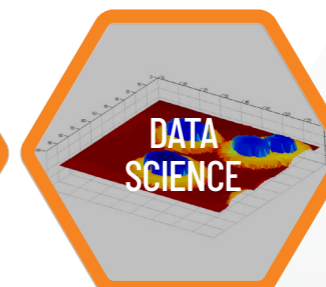
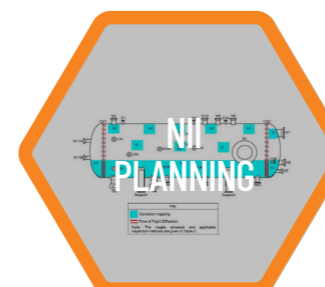
ONSHORE/ TOPSIDE



RESEARCH & DEVELOPMENT



INTEGRITY SERVICES



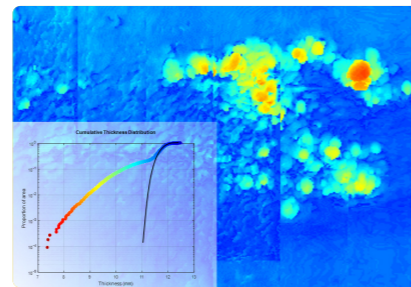
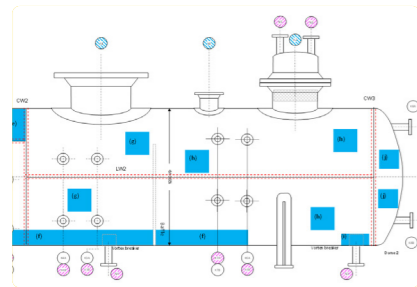
INTEGRITY SERVICES

Sonomatic's integrity services team strives to maximise the value of advanced inspection in the context of integrity management. We achieve this by combining our years of experience in this field with specialised data analytics, statistical methods and custom software development. Traditional integrity management systems are designed around the planning and utilisation of visual inspection and conventional NDT. However, advanced NDT and Non-Intrusive Inspection (NII) make up a growing percentage of the market. This is where we find our niche; supporting integrity management through effective planning for a robust, objective analysis of advanced inspection.

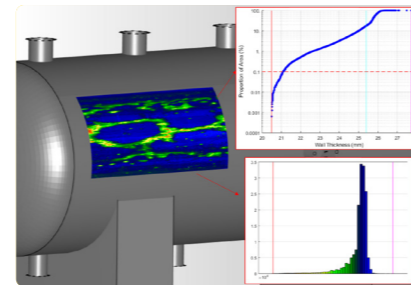
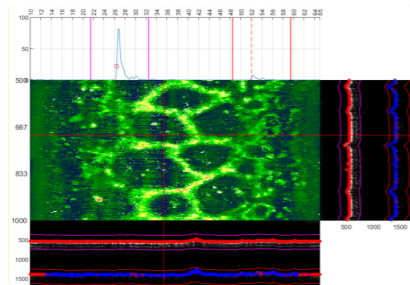
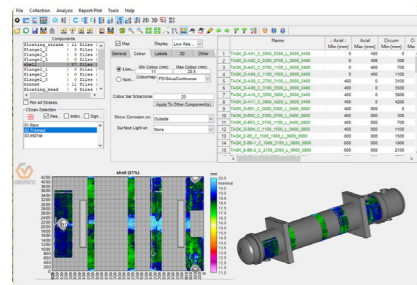
Sonomatic has pioneered the formal industry approach for Non-Intrusive Inspection and has developed practical statistical methods for analysis of inspection data as well as inspection planning through simulation. Sonomatic is well-positioned to support the integrity management sector in its inevitable transition to increased data-driven decision making.

KEY OFFERINGS

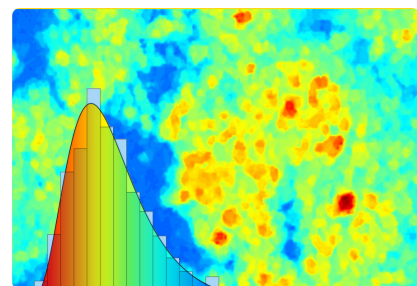
FULLY INTEGRATED NII PACKAGE



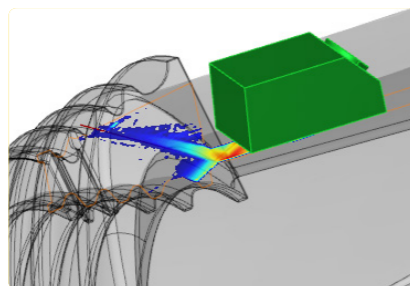
SONOMATIC INTEGRITY MANAGEMENT SOFTWARE - SIMS



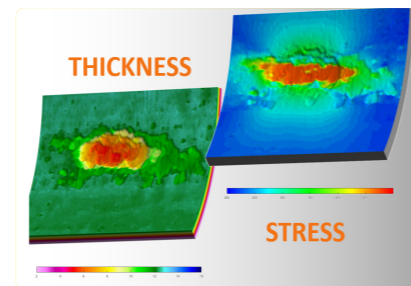
DATA SCIENCE



INSPECTION MODELLING



FITNESS FOR SERVICE (FFS)



CASE STUDIES

KEY SONOMATIC SUCCESS STORIES

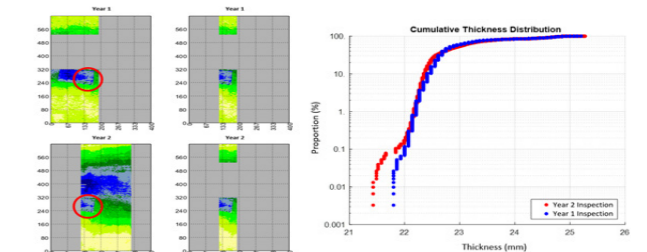
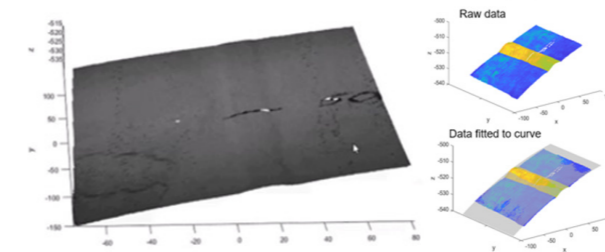


LARGE NII PLANNING AND SCREENING CAMPAIGN

Sonomatic reviewed 190 pressure vessels for NII suitability across various assets for a major North Sea operator. A total of 154 vessels were found to be suitable for NII in principle and 90 underwent full NII assessment and planning, enabling almost all to be removed from shutdown plans and reducing shutdown times. Overall, this was a very valuable process which was hugely appreciated by the client. The results of the project led to significant gains through increased production.

APPLICATION OF NII AT A GAS PLANT

Sonomatic assessed more than 100 pressure vessels at a gas plant for a major oil and gas client. Sonomatic performed NII assessments and Sonomatic integrity staff visited the site along with their technicians to collaborate on the work scope development to ensure that recommended inspection areas were both representative of potential degradation threats and attainable by the inspection. In total, 80% of assessed vessels were suitable and inspected using NII. This significantly reduced the planned shutdown and resulted in production savings of approximately £5 million.



ADVANCED DATA ANALYSIS

Sonomatic were contracted to provide fitness-for-service (FFS) assessments on pressure vessels which were undergoing cycles of high-pressure loading. It was expected that cyclic loading would produce peaking at the stake welds, so high-resolution 3D laser profiling was performed over the welds and surrounding surfaces. Data analysis proved that areas near the weld were actually curving inward. The finite element analysis included this information, resulting in more accurate results for the client who said, "I wish all laser scan data was in the post-processed format we received from Sonomatic".

ADDED VALUE FROM REPEAT INSPECTIONS

Using specialist statistical analysis, Sonomatic adds value to repeat inspections by providing in-depth data comparisons. Where an inspection indicated a significant change in the wall thickness, Sonomatic's proprietary SIMS software allowed advanced data analysis to highlight an external feature, aiding scan alignment. The improved results showed no change to the extent of degradation across the repeated area, and a minor reduction in the absolute minimum. SIMS allows Sonomatic to store comparison data in one project, meaning future inspections can be easily added and compared.

SERVICES

NON-INTRUSIVE INSPECTION (NII)

NII is a safe and viable alternative to conventional internal visual inspection (IVI) that, when executed effectively, offers an equivalent or improved level of assurance, provide significant cost benefits and eliminates the need for Confined Space Entry (CSE).

As key authors of the HOIS recommended practice for NII, published as HOIS-RP-103, Sonomatic is a global leader in the implementation of NII. We are uniquely positioned to offer fully integrated NII, including comprehensive planning and evaluation services as well as advanced NDT capabilities. Our integrity services group has a strong track record of successful NII delivery, with extensive experience in assessments for suitability, workscope development, on site execution, and evaluation for more than 1000 pressure equipment items worldwide.

SUBSEA INTEGRITY SUPPORT

Sonomatic's integrity support capabilities extend to subsea inspection. We can provide formal justification for externally applied sampling inspection of unpiggable pipelines. This includes the design of key inspection requirements through statistical simulation of proposed inspection strategies against expected degradation scenarios, as well as a detailed evaluation of the achieved inspection and estimates for the overall line condition.

Sonomatic also provides support for In-Line-Inspection (ILI) verification using externally applied inspection. This includes evaluation of the ILI and ILI verification data to quantify potential biasing effects. Sonomatic has built the case for the continued operation of a number of subsea pipelines based on the verification of a small number of the deepest reported anomalies.

FITNESS FOR SERVICE

Fitness For Service (FFS) assessments are used to justify safe operation of damaged equipment. Sonomatic provides FFS and remaining life assessments to a range of industry codes and recommended practices. We have extensive experience in reliable defect definition from inspection data. Sonomatic's streamlined approach delivers representative Level 3 FFS based on finite element analysis and high-resolution inspection data at a competitive cost and turnaround time. We have also developed statistical methods to improve degradation rate and future corrosion growth estimates, which are crucial for setting ongoing integrity management requirements.

SONOMATIC INTEGRITY MANAGEMENT SOFTWARE (SIMS)

SIMS has been developed in-house specifically for improving the effectiveness of NII delivery through realisation of a digital twin for pressure equipment condition. This software aims to close the gap between inspection and integrity-related activities in NII by streamlining NII workscope development, data collection, data analysis, statistical analysis and NII evaluation.

A parametrically defined model of the asset is central to linking the key phases of NII. The itemised inspection workscope can be displayed on a 2D or 3D representation of the vessel. The model is used throughout the inspection, allowing accurate recording of inspection locations, data and results. This ensures conformance to the scope, increases reliability, ensures repeatability and provides an intuitive way to access the data. Inspection data can be displayed on the asset model providing improved visualisation and reporting of inspection results for the asset. SIMS also makes this data available for detailed interrogation, facilitating efficient statistical analysis and NII evaluation. Long terms benefits of SIMS include effective data management and detailed comparison of repeat inspection data sets.

INSPECTION DATA ANALYTICS

Data-driven decision making is playing an increasing role in integrity management. Sonomatic is recognised as an industry leader in the development and application of statistical analysis of inspection data. Our approaches facilitate integrity decisions based on the best possible knowledge of the equipment's condition and an understanding of measurement uncertainty. Sonomatic played a key role in the development of the HOIS Recommended Practice for Statistical Analysis of Inspection Data, HOIS12(R8). We continue to innovate our analytical approaches, ensuring the benefits of advances in inspection and monitoring technologies are fully realised in practice.

PIPEWORK INSPECTION STATISTICAL ANALYSIS

Ageing facilities often have a wealth of under-utilised pipework inspection data. Sonomatic has developed analytical methods and custom software to gain insights from this historical inspection. We then use statistical simulations to test future inspection strategies against likely degradation scenarios based on this historical data. This drives the transition to more effective inspection strategies. Sonomatic has supported many ageing facilities with this approach and are experiencing increased interest from new facilities where early adoption can lead to significant through-life efficiency.

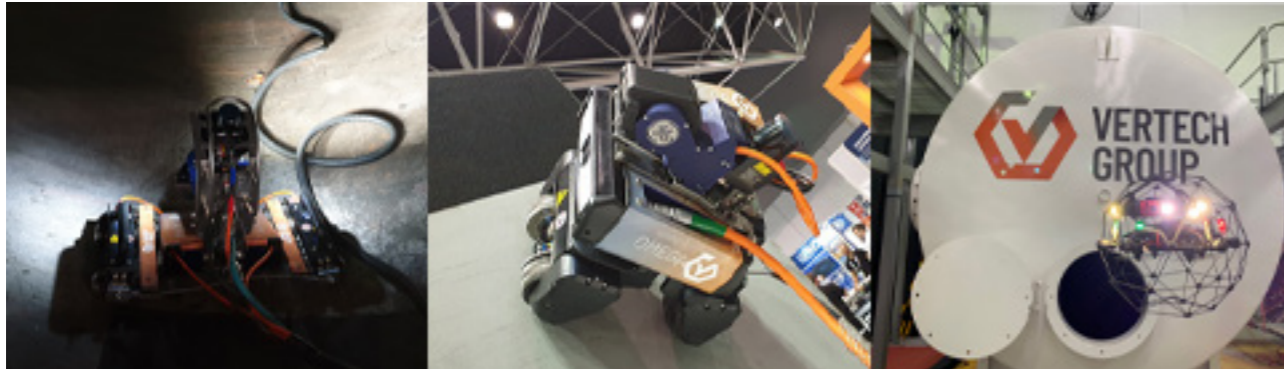


CWL GROUP PARTNERS

VERTECH RDVI

Remote Digital Visual Inspection (RDVI) is the use and application of digital inspection systems to internally inspect equipment without the need for Confined Space Entry (CSE). The Vertech RDVI Division is the amalgamation of cutting edge technology, multi-skilled site based crews and a technically experienced management team. This strong foundation has allowed us to become the pathfinders of this emerging industry, setting the standard for others who follow.

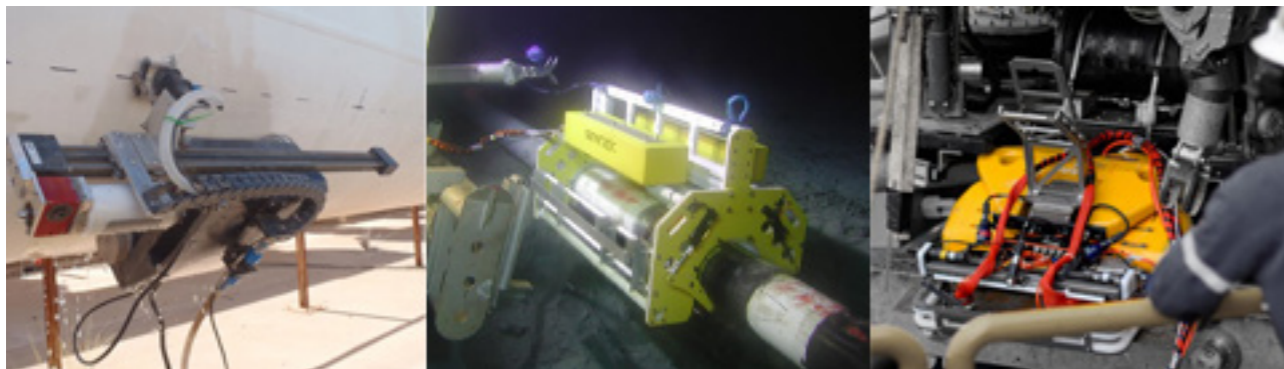
Our staff accept nothing but excellence from themselves and each other, which has led to the RDVI team being known throughout the industry as the service provider of choice. Across the whole of CWL Group, we pride ourselves on executing and delivering high profile, technically challenging scopes due to our commitment to innovation, the best people and our absolute client focus.



SONOMATIC FIELD SERVICES

Sonomatic Field Services delivers both topsides and subsea advanced NDT. Sonomatic has a strong capability in the research and development of advanced NDT techniques, equipment design and delivery of advanced inspections. Our Integrity Support Team and Specialist Inspection Division work closely together to design and execute effective inspection solutions for a given combination of expected damage and integrity management requirements.

Sonomatic are uniquely positioned in that we offer advanced NDT execution capabilities in addition to detailed NII planning and evaluation services, thereby providing the full suite of NII services to clients. This can enable huge efficiencies in inspection data management and overall project delivery.



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