

CAPABILITY STATEMENT

R&D ENGINEERING

THE PURPOSE

This document is designed to help our clients and supply chain partners understand our group operating structure, along with a high-level overview of the services, benefits, and specialist solutions delivered through our E2i engineering, design, and development division.



WHO WE ARE



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



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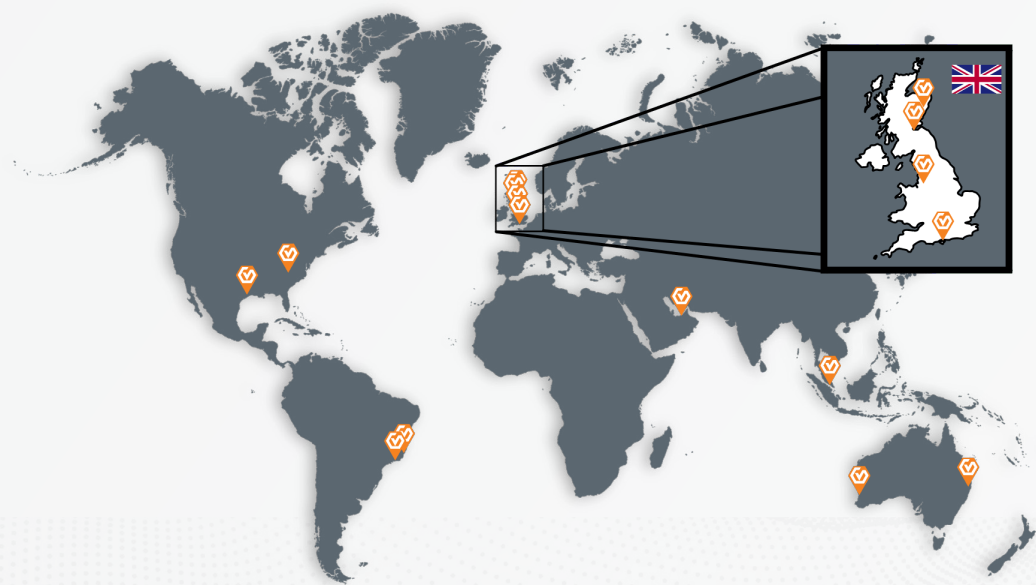


Sonomatic specialise in the design, development and application of Non-Destructive Testing (NDT) inspections. Since the company's formation in the 1980s, we have combined these NDT processes with integrity engineering capabilities to provide fully integrated inspection packages that directly meet the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

Bringing innovative bespoke inspection solutions to the market through E2i, our in-house department dedicated to developing equipment, software, and robotics, Sonomatic brings innovative, bespoke inspection solutions to market as a global leader in 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



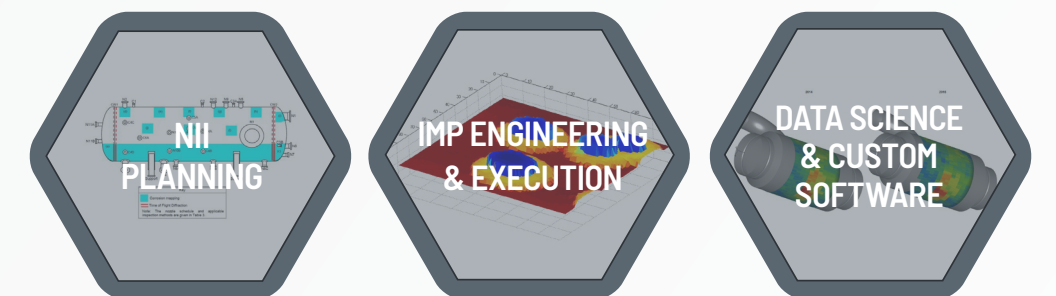
WHAT WE DO

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 (E2i) 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.

RESEARCH & DEVELOPMENT



INTEGRITY SERVICES



SUBSEA



ONSHORE/ TOPSIDE



E2i CAPABILITIES

Sonomatic Engineering to Inspire (E2i) is a world-leading engineering, design and innovation division, specialising in cutting-edge inspection solutions. With an unrivalled pedigree in subsea engineering and advanced Non-Destructive Testing (NDT), we operate globally and collaborate with CWL Group companies to design and manufacture:

- ✔ Topside and subsea robotic deployment systems
- ✔ Customised, scalable inspection tooling
- ✔ Surface cleaning systems
- ✔ Integrated NDT methods, software, and client asset integration



Our advanced in-house design, manufacturing, assembly, and testing facilities, combined with our team's deep expertise in mechanics, electronics, UT, MEC™ and software, all under one roof, enable rapid turnaround of equipment for the most demanding environments, including:

- ✔ Deepwater and subsea conditions
- ✔ High-temperature and nuclear facilities
- ✔ Crude oil and corrosive environments

Operating from state-of-the-art engineering facilities, E2i supports major operators, contractors, and Sonomatic offices worldwide. As part of the CWL Group, we leverage a collaborative network of specialist companies to accelerate innovation and enhance problem-solving across diverse sectors—setting the benchmark for inspection technology that empowers asset integrity management globally.

INSPECTION TECHNIQUES

Ultrasonic Testing remains the backbone of modern NDT, but no single technique can address every inspection challenge. Sonomatic combines conventional UT with a comprehensive suite of advanced methods including TOFD, PAUT, PEC, HTHA, LRUT, Multiskip, Microwave, EMAT and CHIME, alongside proprietary techniques such as MEC™ and DRS™, both developed in-house. By selecting and tailoring the most appropriate techniques to the asset, defect type and operating environment, Sonomatic delivers reliable, high-integrity inspection outcomes.

OUR IN-HOUSE EXPERTS SPECIALISE IN:

- ✔ **Mechatronics & Robotics** – Advanced deployment systems for automated inspections
- ✔ **Electrical & Mechanical Engineering** – Advanced electronics team who design custom electronic solutions and high-performance tooling, sensor integration, and control systems
- ✔ **NDT Engineering** – Phased Array, Ultrasonic Testing, Magnetic Eddy Current™, Pulsed Eddy Current & TOFD NDT Techniques
- ✔ **NDT Specialists** – Expertise in ultrasonic and electromagnetic testing
- ✔ **Deepwater Engineering** – Ensuring subsea and NDT technique reliability
- ✔ **Software & Data Science** – Custom algorithms, real-time analytics, and diagnostics
- ✔ **Materials & Corrosion Engineering** – Optimising inspection strategies for extreme environments
- ✔ **R&D Experts** – Driving innovation in robotics, sensors, and NDT methodologies



DESIGN ENGINEERING



Full electromechanical design across mechanical, electronic and software disciplines.

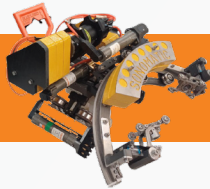
- ✔ Mechanical CAD and Finite Element Analysis (FEA)
- ✔ Electronic PCB, component and electrical cable design
- ✔ Software, ultrasonic and VR modelling

INSPECTION TOOLING & DESIGN

Bespoke inspection solutions for pipelines, pressure vessels and storage assets.

- ✔ Subsea and topside pipeline inspection and screening
- ✔ Internal and external caisson inspection
- ✔ Pressure vessel and online storage tank inspection
- ✔ Pipeline engineering and solutions

IN-HOUSE MANUFACTURE



Complete fabrication capability from additive manufacturing to subsea-ready assemblies.

- ✔ FDM and SLA 3D printing (incl. carbon-fibre reinforced polymers)
- ✔ Cable assembly (topside and subsea)
- ✔ Specialised NDT probes and subsea component marinisation



LOGISTICS

End-to-end international freight management – getting inspection equipment to site, on time, anywhere in the world.

- ✔ Worldwide equipment supply, mobilisation and tracking
- ✔ Freight-forwarding, customs agent coordination, including remote and emerging-market destinations (e.g. African nations)
- ✔ Export documentation – manifests, commercial invoices and country-specific customs paperwork
- ✔ Dangerous / hazardous goods handling and compliant equipment packaging
- ✔ Time-critical route planning and transit optimisation under tight project deadlines

IN-HOUSE TESTING

Comprehensive qualification, from component-level simulation to full system integration.

- ✔ Pressure testing to 4000m, dry/wet and load testing
- ✔ High-temperature engineering and testing
- ✔ FEA, PSpice and CWA modelling (Software, BeamTool)
- ✔ NDT technique development, FAT and SIT

TOOLING DEVELOPMENTS

SUBSEA INSPECTION TECHNOLOGY

Sonomatic E2i's subsea inspection tools are engineered through a rigorous design and development process to tackle the challenges of extreme underwater environments. Our multidisciplinary team integrates mechanical, electrical, and software engineering with robotics and advanced NDT techniques to deliver high-performance, custom inspection solutions.

Each tool undergoes iterative design, simulation, and prototyping to optimise structural integrity, hydrodynamics, sensor precision, and remote operability. Extensive in-house testing ensures reliability in deep water, strong currents, and extreme temperatures.

Our advanced subsea tools—including the MAG-Rover, ROV-iT, and Stingray Scanner—enhance efficiency, accuracy, and safety. Using high-precision ultrasonic and electromagnetic technologies, ROV deployment, and automated scanning, they minimise human intervention while delivering high-quality inspection data to support asset integrity management.

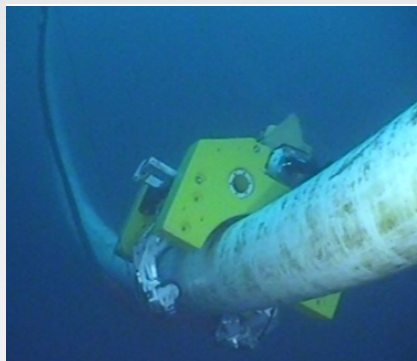
MAG-ROVER

The MAG-Rover was developed as a remotely steerable ultrasonic scanner for deep-water subsea inspection and cleaning. Designed for ROV or diver deployment, it enables precise inspection of pipelines, caissons, conductors, and structural welds at depths of up to 1600m.

For a subsea oil storage tank inspection, the MAG-Rover was enhanced with an integrated cleaning system, allowing it to remove marine growth and seabed silt while performing high-accuracy corrosion mapping. This innovation enabled simultaneous cleaning and inspection, ensuring high-quality ultrasonic data collection in challenging environments. With its steerable design, flexible deployment, and real-time data transmission, the MAG-Rover supports efficient and effective asset integrity management.



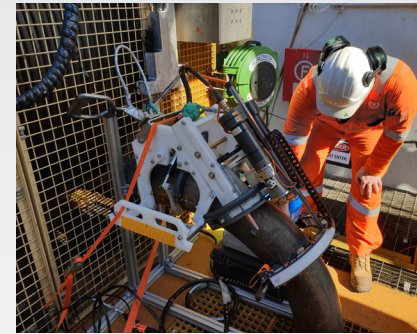
MEC-HUG™ PIPECRAWLER



The MEC-Hug™ PipeCrawler was developed as an advanced self-crawling inspection system for flexible risers and pipes, providing reliable detection of defects such as corrosion, cracks, and wire misalignment. Designed for both axial and circumferential scanning, it accommodates varying wire angle structures while ensuring high-accuracy data collection.

Utilising MEC-FIT™ technology, the system combines direct current magnetic and eddy current fields to penetrate multiple wire layers, enabling precise defect identification. Deployable via work-class or inspection-class ROVs, the MEC-Hug™ PipeCrawler operates in both vertical and horizontal orientations, delivering real-time encoded inspection data to support asset integrity assessments.

GOOSENECK BEND SCANNER



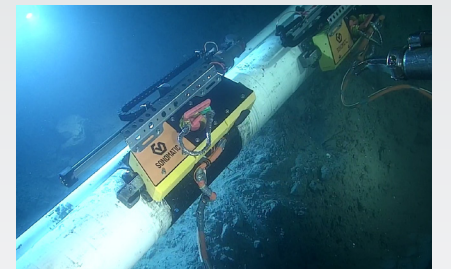
The Gooseneck Bend Scanner was developed to provide high-resolution corrosion mapping for complex geometries, such as duplex steel gooseneck bends and elbows, at water depths of up to 1400m. Designed for ROV deployment, it enables full 360° circumferential and axial inspection along the entire bend length.

Using a bespoke variable-diameter scanning frame and the Sonomatic Nautilus dual-axis scanning system, the scanner ensures precise ultrasonic thickness measurements and accurate positional feedback. Advanced data presentation software corrects for curvature effects, delivering reliable corrosion mapping to support asset integrity assessments.

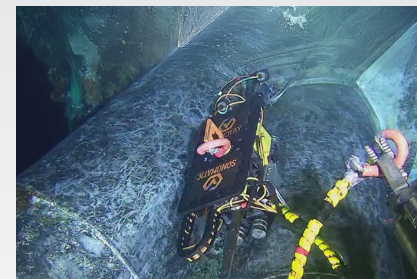
STINGRAY SCANNER

The Stingray Scanner is an advanced automated inspection system designed for subsea asset integrity applications. Its lightweight design allows deployment from both work-class and inspection-class ROVs, enabling efficient inspection of pipelines, risers, splash zone structures, and other critical offshore infrastructure while reducing operational risk and maximising inspection coverage.

Equipped with advanced ultrasonic inspection technologies, including Dynamic Response Spectroscopy (DRS™) and Time of Flight Diffraction (TOFD), the Stingray Scanner delivers high-quality, real-time inspection data to support informed maintenance decisions and long-term asset integrity management.



NODERAY SCANNER



The NodeRay Scanner was designed to overcome the limitations of traditional inspection methods. Using bespoke software, its articulating multi-function head allows precise automated tracking of intricate node geometries, ensuring consistent probe positioning and skew throughout the inspection process. The adaptive crawler platform accommodates a wide range of diameters and configurations, eliminating the need for multiple scanners and reducing operational complexity and time. Together, these features provide high accuracy, repeatability and reliability for inspecting irregular surfaces and complex weld geometries.

I-CLAW



Our advanced subsea Phased Array Ultrasonic Testing (PAUT) and Time of Flight Diffraction (TOFD) system is designed for i-tube weld inspection. Deployed via ROV, this robotic solution was specifically developed for an asset life extension project, providing accurate and reliable weld integrity assessments.

With custom PAUT and TOFD capabilities, the i-Claw provides unparalleled precision in detecting and sizing weld flaws and cracks in challenging materials.

MINI ROVIT

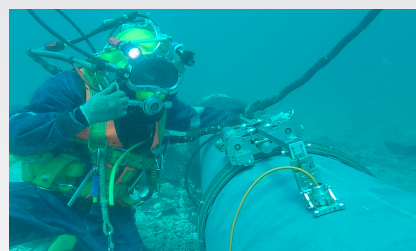


The Mini-ROVIT tool was developed to provide cost-effective wall thickness scanning for subsea flowlines. Designed for deployment via small ROVs, it enables corrosion mapping of field joints without requiring large work-class ROVs or dedicated DSVs, significantly reducing costs.

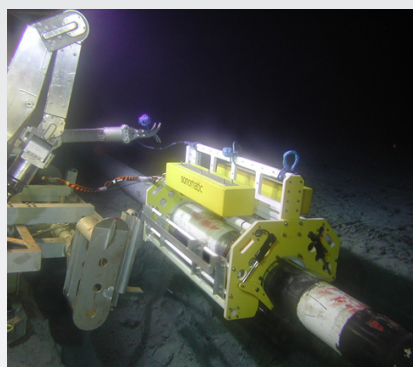
Key features include integrated ROV design, circumferential cleaning, and high-precision scanning for pipelines ranging from 6 to 20 inches. Its compact size allows rapid mobilisation from vessels of opportunity, minimising operational expenses. This innovation has led to cost savings of up to 70% while enhancing the efficiency of subsea pipeline integrity assessments.

NAUTILUS

The Nautilus is a motorised manipulator designed for subsea pipework inspection at depths up to 250 meters. Remotely controlled from the surface, it integrates with a Sonomatic Microplus ultrasonic imaging system and supports various inspection techniques, including corrosion mapping, pulse-echo shear wave, and TOFD. Diver-deployed, it inspects pipewalls, welds, flanges, and complex geometries. Its rigid, hinged collar enables precise transducer positioning, while its low-profile design allows operation with just 120 mm clearance.



ROV-IT



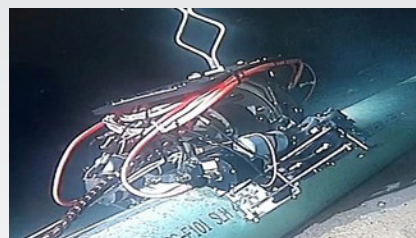
The ROV-IT system was developed to provide advanced subsea inspection capabilities without the need for diver intervention, reducing operational risks and costs. Designed for deployment via work-class ROVs, it enables efficient inspection of pipelines, risers, caissons, and structural assets at depths of up to 3000m.

ROV-IT integrates multiple inspection techniques, including corrosion mapping, Time of Flight Diffraction (TOFD), Phased Array, and Dynamic Response Spectroscopy (DRS™). With real-time data transmission and minimal dredging requirements, it delivers accurate and reliable integrity assessments, supporting effective asset management and life extension strategies.

MAG-ST

The MAG-ST tool is a magnetic-wheeled, steerable scanner developed by Sonomatic for inspecting deep-water, unpiggable gas pipelines. Deployed by an ROV, it rapidly screens pipelines using SH-EMAT, L-EMAT, and Multiskip techniques.

By positioning transducers at 2 and 10 o'clock, it inspects the full pipe circumference in one pass. The tool identifies metal loss greater than 20% of the nominal wall thickness without costly modifications for in-line inspection.



TOPSIDE INSPECTION TECHNOLOGY

Sonomatic E2i's topside inspection solutions are driven by continuous engineering innovation and close collaboration with clients and site personnel. Our expertise in mechanical design, automation, and advanced NDT techniques ensures each tool is optimised for efficiency, accuracy, and minimal disruption.

Our MEC Scanners, Internal Inspection Tool, Internal Cleaning Tool (ICT) and advanced ultrasonic systems provide cutting-edge solutions for corrosion mapping, defect detection, and structural integrity monitoring—minimising downtime and costly shutdowns.

Through continuous development and industry partnerships, Sonomatic E2i delivers high-performance topside inspection technology that supports long-term asset integrity.

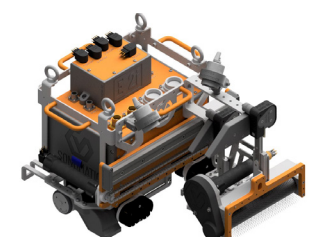
MEC™ SCANNER



The MEC™ (Magnetic Eddy Current) scanner was developed as an advanced electromagnetic inspection tool for rapid corrosion screening. It builds on the proven SLOFEC™ technique, offering high sensitivity in detecting internal and external defects, even through coatings.

The latest MEC™ technology enhances detection capabilities with improved sensor performance, increased penetration depth, and real-time scan results. It enables fast, reliable inspection of ferromagnetic and non-ferromagnetic materials across topside, subsea, and splash zone applications, supporting Non-Intrusive Inspection (NII) and asset integrity assessments.

AXOLRAY RCI



The AxolRay RCI is a compact, automated inspection solution designed for topside non-intrusive inspection (NII) applications. Inspired by the success of the Subsea Stingray, the AxolRay RCI has been developed as a dedicated topside inspection solution. Rather than replicating the subsea system, it applies the same modular approach and proven inspection principles in a simplified configuration tailored to topside applications.

Adapted from proven inspection technology, it provides a practical and cost-effective approach for assessing pipelines, pressure vessels, tanks, caissons, and other critical infrastructure assets. Its lightweight, modular design enables rapid deployment across a range of inspection environments, helping to reduce inspection time while improving accessibility. The AxolRay RCI delivers reliable, high-quality data to support asset integrity and maintenance programmes.

INTERNAL INSPECTION TOOL

The Internal Inspection Tool was developed to provide accurate and reliable ultrasonic inspection of offshore risers, caissons, and structures, ensuring their integrity and safe operation. These critical components are vulnerable to degradation, and effective inspection is essential to prevent failures that could impact surrounding infrastructure.

Internal Inspection Tool enhances inspection capabilities with a continuous spiral scanning technique, enabling efficient corrosion mapping and defect detection in both air and water environments. By leveraging advanced ultrasonic data analysis, Internal Inspection Tool ensures precise measurements even on corroded surfaces, supporting informed integrity management decisions.



INTERNAL CLEANING TOOL

Going hand-in-hand with the Internal Inspection Tool, the Internal Cleaning Tool is an environmentally safe cleaning system that provides the most effective caisson cleaning prior to the inspection. The ICT is capable of operating below sea level to remove all scale and marine growth from the caisson interior back to deck level for disposal.

This prevents debris from dropping to the seabed or being sucked into the lift pumps on adjacent caissons.

Combined we can conduct HP water jet cleaning, digital image surveying and NDT inspection from a single mobilisation.



SPLASHZONE INSPECTION TECHNOLOGY

The splash zone presents significant challenges due to constant wave action, difficult access, and heavy marine growth. To address these, Sonomatic divisions RotoTech and Innospection developed specialised tooling, including the Roto Piler, Roto Climber® MK2 system, the Roto Climber Assessor (Mini) and the MEC™-MPS200+, enabling efficient inspection and maintenance of risers, caissons, and conductors in this high-risk environment.

These solutions integrate advanced scanning, cleaning, and ultrasonic inspection technologies, providing operators with clear, accurate data while minimising hazardous manual interventions. Through continuous innovation and real-world application, our splash zone technologies help ensure the long-term integrity of critical offshore structures.

MEC™-MPS200+ SCANNER



The MEC™-MPS200+ Scanner was developed to provide high-sensitivity inspection of risers, caissons, conductors, and structures, ensuring asset integrity in splash zones and subsea environments. Utilising advanced Magnetic Eddy Current (MEC™) technology, it detects and sizes internal and external defects through coatings and high wall thicknesses.

With integrated ultrasonic sensors and an advanced cleaning system, the MEC™-MPS200+ enables efficient, real-time data acquisition while removing marine growth during inspection. Its flexible deployment options and high-speed scanning capabilities make it a reliable solution for remote, non-intrusive asset integrity assessments.

ROTO PILER

The Roto Piler is a compact, Zone 2-rated high-pressure cleaning system designed for safe and efficient removal of marine growth from risers, caissons, conductors, and other splash zone structures. With twin Barracuda rotating nozzles and a robust deployment frame, it delivers reliable performance in high-energy offshore environments, without the need for divers or ROVs.

- ✔ ATEX Zone 2 Rated
- ✔ Compact, modular design
- ✔ 2500 bar twin Barracuda nozzles
- ✔ Non-intrusive operation with no diver or ROV intervention required



MK2 ROTO CLIMBER®



Building on the foundation from The Roto Climber® Assessor (Mini), the Mk 2 Roto Climber® was developed as a hydraulically driven system to accommodate larger-scale inspection and cleaning requirements. With increased power and efficiency, the Mk 2 is designed for heavy-duty applications, including deepwater and splash zone operations. Its modular design allows for multiple attachments, such as high-pressure cleaning and advanced inspection tools, ensuring comprehensive asset integrity management.

- ✔ ATEX Zone 2 Rated
- ✔ Adaptable
- ✔ Modular
- ✔ Advanced NDT Technique Compatibility

ROTO CLIMBER® ASSESSOR (MINI)

The Roto Climber® Assessor (Mini) is an electrically powered system designed for survey and inspection. It offers a lightweight and agile solution for detailed assessments in confined areas. With its compact design and battery-powered operation, it requires minimal deck space and no external power sources, making it highly mobile and efficient for inspection tasks in challenging environments, tight access areas and for smaller diameter pipework. Perfect for rope access, scaffold setups or confined splash zone tasks.

- ✔ ATEX Zone 2 Rated
- ✔ Battery Powered
- ✔ Compact & Lightweight
- ✔ Electrically Driven

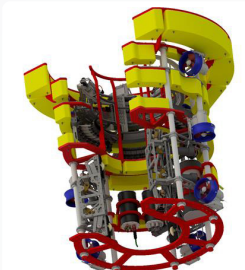
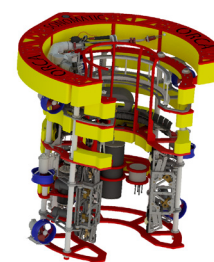


TECHNOLOGY IN PROGRESS

Innovation at E2i is driven by real-world inspection challenges. The following technologies are currently in development, designed to streamline operations through integrated robotic systems that combine deployment, inspection, and cleaning into single, efficient solutions—reducing intervention time and improving data reliability in subsea environments.

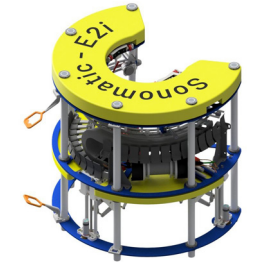
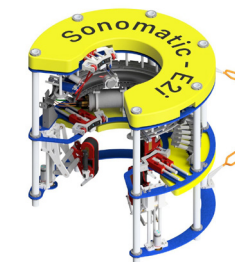
ORCA FXJ

A one-stop solution for flex joint inspection. This asset-deployed tool can fly into position on a riser, position under the flex joint, then clean and inspect.



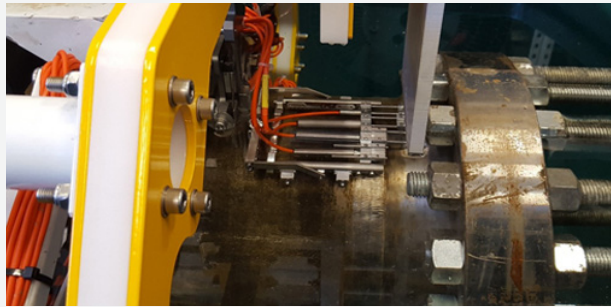
ORCA CRL

A one-stop solution for riser inspection. ROV-deployed, it cleans, inspects, climbs out of the water, and bypasses guides.



CASE STUDIES

KEY SONOMATIC SUCCESS STORIES



CRA FLANGE WELDS

Following a hydrocarbon release, there was an urgent requirement to inspect pipe to flange welds on a 10" CRA (corrosion resistant alloy) pipe system at 500m water depth. Not only was there access restrictions due to the close proximity of the flange bolts and tapers, but the welds were also CRA with typically dendritic grain structures. The Sonomatic R&D team developed angle shear wave and TOFD inspection techniques to provide reliable inspections of the weld/HAZ regions. To overcome the tight access/bolts/tapers the team developed a unique "mirror" approach to access the welds below the bolts. A Sonomatic ROV-iT system was modified to allow safe deployment and the critical welds were reliably inspected by ROV deployment.



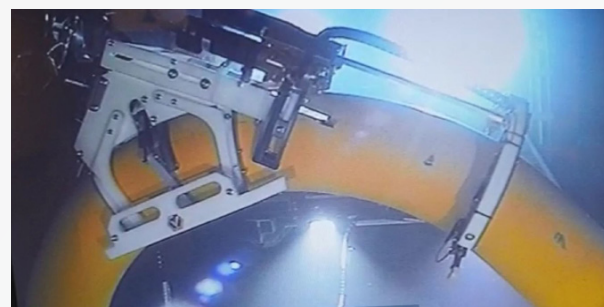
DRS COMPOSITE REPAIR INSPECTION

The aim of the validation was to determine the capabilities of DRS in penetrating the repair and measuring the thickness of the underlying steel by comparison with ultrasonic (UT) corrosion mapping data collected prior to the application of the repair. The validation sample was a 30", schedule 40 pipe with extensive internal natural corrosion. The UT and DRS inspections were carried out using Sonomatic's automated Nautilus scanner, a conventional UT transducer and a custom DRS transducer. The scans were collected in 1mm increments axially and 4mm circumferentially. They were then processed to create maps showing the steel thickness.



PHASED ARRAY & ACFMT DEPLOYMENT ON SUBSEA NODES

Sonomatic successfully delivered the first full metric subsea node inspection using Phased Array combined with ACFMT, overcoming the long-standing challenge of inspecting complex weld geometries in subsea environments. A customised Stingray Scanner with enhanced node tracking and an articulating multi-function head ensured precise probe positioning, while rapid technique development was fully validated on representative test pieces. Following system and operator qualifications, the project achieved reliable detection of surface-breaking cracks and comprehensive weld coverage.



GOOSENECK BEND INSPECTION

A client required an ROV deployed high resolution corrosion mapping inspection for 360° circumferentially, and along the full length, of 8", 10.75" and 12" Duplex steel Gooseneck bends and elbows at water depths of up to 1400m. To expedite the development, the solution was to design and fabricate a bespoke variable diameter scanning frame to deploy a Sonomatic Nautilus dual axis scanning system with hydraulic clamps and dual inspection heads such, that full 360° coverage could be achieved. The data presentation software was enhanced to correct the data for any curvature effects.

KEY CONTACTS

SONOMATIC

Europe & Africa

Charles Loader - General Manager

T: +44 (0) 1925 414 000 | M: +44 (0) 7376 714 765

E: Charles.Loader@sonomatic.com

Australia & NZ

Alex Cesan - General Manager

T: +61 498 442 666

E: Alex.Cesan@sonomatic.com.au

Americas

Esteban Cesan - President

T: +1 832 977 0303

E: Esteban.Cesan@sonomatic.com

Agata Surowiec Morgan - Vice President
(Business Development)

T: +1 832 316 9925

E: Agata.Surowiec@sonomatic.com

Middle East, Caspian & Black Sea

Clayton Webb - Regional Manager

T: +971 26 580 708

E: Clayton.Webb@sonomatic.com

Worldwide

John Lilley - Senior Technical Consultant

T: +44 (0) 1925 414 000

E: John.Lilley@sonomatic.com

RII - Worldwide

Sean Peters - Project Manager

T: +44 (0) 1925 414 000 | M: +44 (0) 7386 807 346

E: Sean.Peters@sonomatic.com

Australia

Jonathan Millen - Operations Manager

T: +61 477 030 058

E: Jon.Millen@sonomatic.com.au

South East Asia

Zach McCann - Regional Manager

T: +60 361 581 185 /1180

M: +60 12 555 1569 / +61 404 797 670

E: Zach.McCann@sonomatic.com.my

Gangatharan Kaniappan - Head of Operations
and Business Development

T: +60 361 581 185 /1180 | M: +60 123 282 650

E: Gangatharan.Kaniappan@sonomatic.com.my