VERTECH GROUP

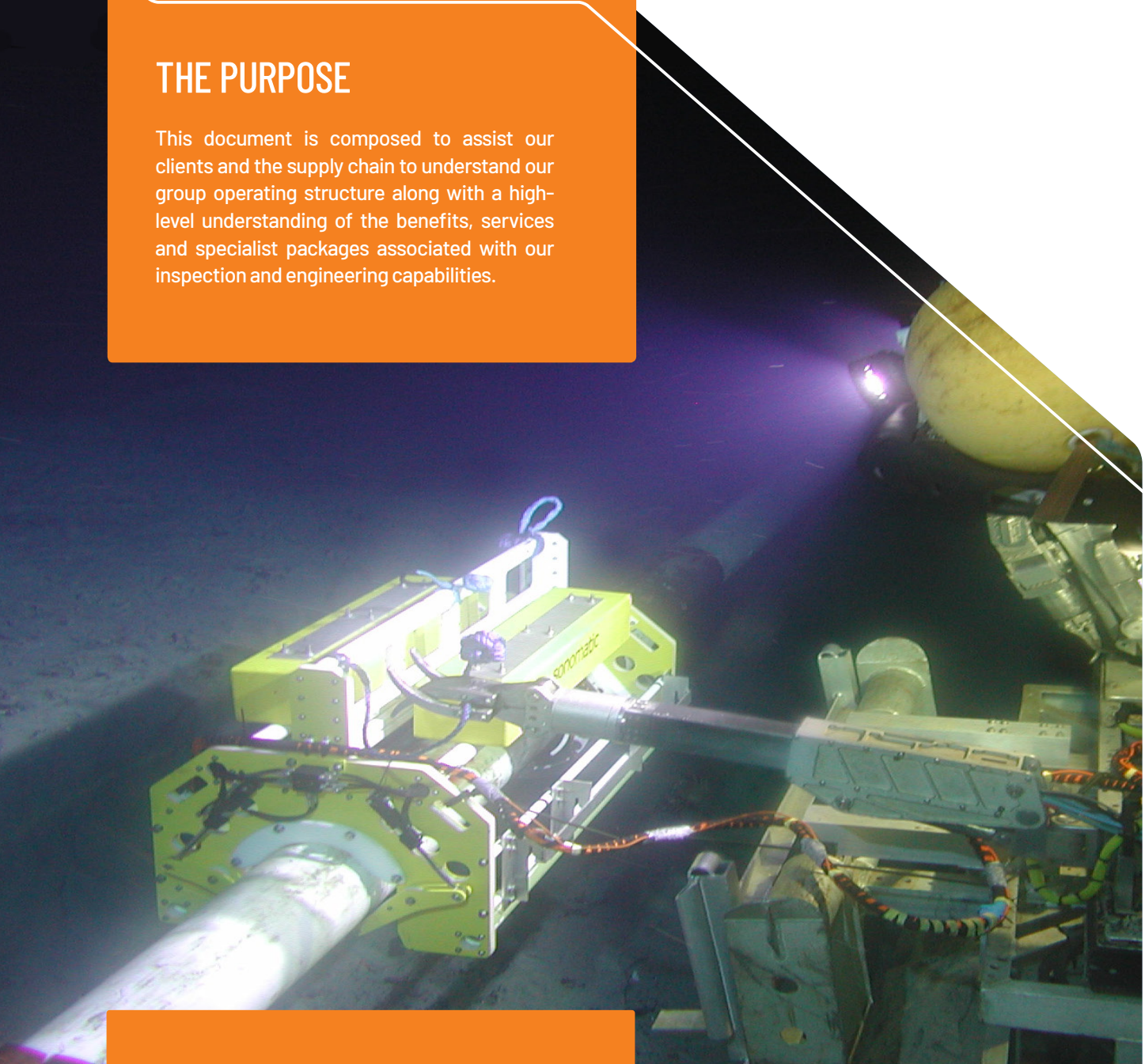
SONOMATIC

CAPABILITY STATEMENT

SONOMATIC SUBSEA

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 inspection and engineering capabilities.



WHO WE ARE

VERTECH GROUP

Vertech, Sonomatic, Geo Oceans and Blue Ocean Marine Services have combined into a single group that compliments each other's strengths. As a cohesive unit we can provide a wide range of services and specialist packages tailored to the needs of each client. No matter what the scope, we offer the very best mechanical, coating, alternative access, rigging, visual inspection, ROV, and NDT services, all within one group.

OWNERSHIP STRUCTURE

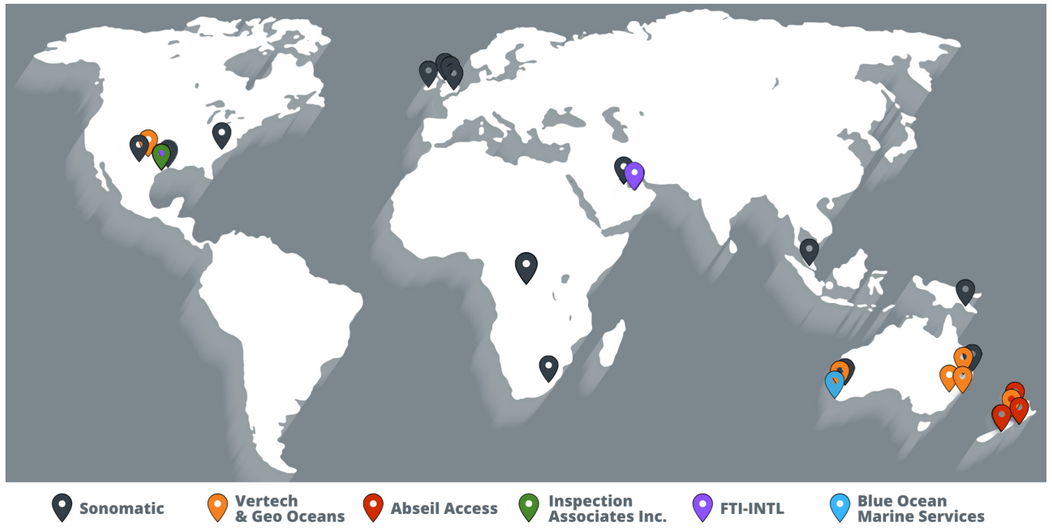
SONOMATIC

In Australia, Sonomatic operates as the Advanced and Subsea specialist arm of Vertech Group. Sonomatic are experts in NDT inspection design, development and application combined with integrity engineering capabilities, and have been servicing many industry sectors since the 1980s.

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

Sonomatic is committed to providing accurate proactive inspection and engineering solutions that enable Clients to manage the integrity of newly constructed and maturing assets, while making informed and cost-effective decisions crucial to the life extension and safety of asset life.

GLOBAL FOOTPRINT



WHAT WE DO

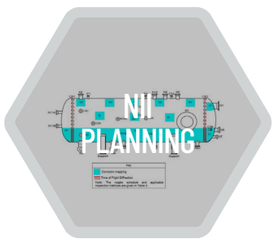
Sonomatic provide integrity engineering and NDT services at every stage of a project's life cycle. NDT subject matter experts assess each scope of work individually to ensure that the inspection solution(s) will meet the desired deliverables. If a unique solution is required, our R&D department can design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

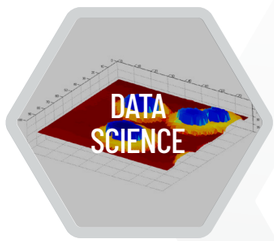
SUBSEA

ONSHORE/ TOPSIDE

RESEARCH & DEVELOPMENT

INTEGRITY SERVICES





SUBSEA

Our primary inspection philosophy is that design and execution may require one or more solution depending on the expected defect mechanism, distribution, severity, location and what information is necessary to make an assessment of the condition of the asset.

Our portfolio of NDT technologies can provide qualitative (screening/discovery) and quantitative (sizing) information to meet those inspection deliverables. These can be applied on piggable pipelines in lieu of in-line inspection (ILI) and/or for ILI verification and on unpiggable pipelines and structural components. It is common practice to use a strategic approach to maximise productivity on a subsea campaign by using the discovery technologies to prove the absence of damage, and where any features of interest are located and require critical sizing, then these can be assessed using quantitative methods.

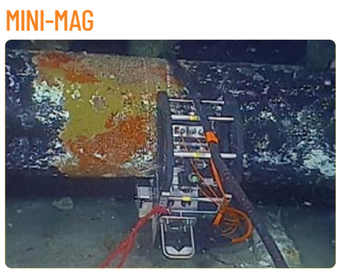
Sonomatic support the development of inspection technologies, specialising in the design and manufacture of a large range of custom-built ROV-deployed and diver deployed scanners that can be mounted via magnetization or hydraulic clamping to the component.

INSPECTION TOOLS

MAG-ROVER

MAG-ST

MINI-MAG

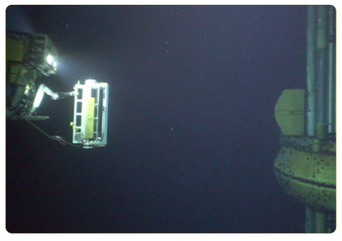


MAG-NAUTILUS

MAG-CRAWLER

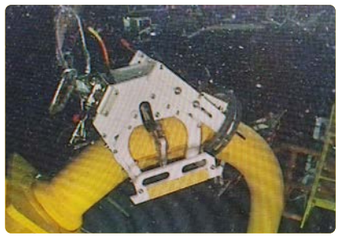
RAPTOR 2

ROV-IT



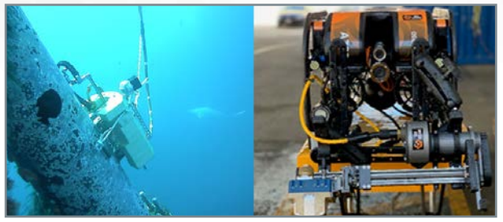
NAUTILUS

BEND SCANNER



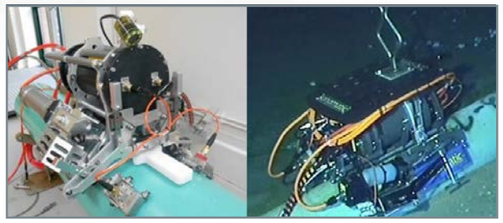
CASE STUDIES

KEY SONOMATIC SUCCESS STORIES



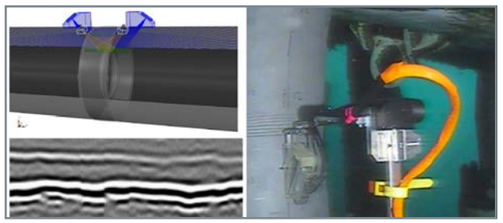
ASSET DEPLOYED ADVANCED NDT

Sonomatic was contracted to deploy ACFM and Ultrasonic Corrosion Mapping on critical risers. A detailed feasibility study identified Sonomatic's Mag-Nautilus deployed by Geo-Oceans' vLBV suitable for the work. A multi-disciplined ROV and Advanced NDT team were mobilized to the facility for the work. All deployment was successfully carried out directly from the facility deck. ACFM and ultrasonic corrosion mapping was completed with no requirement for a DP vessel or divers, providing a safer approach with significant cost savings versus previous approaches.



EXTERNAL SCREENING OF SUBSEA PIPELINES

A client operated numerous subsea pipelines that were not designed for in-line inspection and required an assessment of their condition. The inspection to assess their condition had to be performed using externally applied tools with rapid scanning capability. Sonomatic designed and developed a bespoke magnetic wheeled, steerable scanner that is deployable by an ROV for the inspection which was able to deploy EMAT and Multiskip. From the top of the pipe, the techniques were able to inspect the full circumference of the pipe in one pass. An average of 320 metres was scanned per day with over ten kilometres of pipe scanned.



ROV & DIVER DEPLOYED PHASED ARRAY ULTRASONIC TESTING & TOFD TESTING

Sonomatic was engaged for a critical inspection of spider buoy welds to enable life extension. The requirement was an inspection of dissimilar heavy wall duplex and super duplex girth welds with material thickness up to 57 mm thick with a high POD for small flaws. The inspection included TOFD, ACFM and use of advanced PAUT data capture, with the capacity for plain wave imaging, total focusing method and full matrix capture. Blind validations were successfully carried out and all welds were successfully scanned. This successful inspection justified the life extension of the I-Tubes.

CHALLENGING ACCESS

A client required inspection on various conductors located within concrete cells at the base of the structure with limited access. This required an advanced ultrasonic tool to be deployed by an opening that was 625 mm in deep waters. Access was simulated to assess that a MAG-Nautilus tool could be deployed via an LBV ROV through the small opening available. In total 624 connectors were inspected and all equipment successfully retrieved.

SONOMATIC SUBSEA TECHNIQUES

EMAT TECHNOLOGY

EMAT technology is performed from top-of-line and has the capacity to detect internal and external corrosion on subsea pipelines with NWT <15 mm with coating thickness up to 4 mm.

The technique does not require direct coupling as the input and received signals are generated by electromagnetic responses. This screening technique provides details of the lateral extent of corrosion with banding to indicate the through-wall severity level.

SATURATION EDDY CURRENT FAST SCREENING

SEF is also an electromagnetic technique performed on top-of-line and used for localised corrosion detection of the internal and external surfaces of subsea pipelines. SEF inspection is a comparative NDT method meaning that all results obtained during the inspection are compared and evaluated against results from the calibration scan. SEF provides qualitative through-wall sizing information with results sentenced in four sizing ranges 0-19%, 20-39%, 40-49%, >50%. Once an actual SEF defect indication in the area inspected is verified and confirmed with ultrasonic testing, the measurement can then be used to adjust the final calibration to aid the accuracy of the analysis.

PULSED EDDY CURRENT (PEC)

PEC is a comparative technique whereby advanced processing of the eddy current signal decay and comparison with a reference signal, allows for the determination of the average wall thickness (AWT). This fast screening method allows for the assessment of the general condition of structural steel and is best suited for general corrosion type defects in subsea pipelines. A major benefit of PEC is its ability to inspect through challenging coatings and marine growth.

MULTISKIP

Multiskip is an ultrasonic rapid screening technique for corrosion and erosion detection on subsea pipelines ≥4" diameter. It uses two transducers mounted on wedges in a pitch-catch to send angled shear wave beams through the pipe wall by skipping multiple times off the ID and OD surfaces. The system is capable of high speed, high resolution data collection. For corrosion, loss of signal amplitude, reduction in signal arrival times and changes to signal shape are used to provide qualitative and quantitative information.

GUIDED WAVE TESTING (GWT)

GWT is primarily a screening method used only to establish if there are any corrosion issues that need further investigation. Long lengths of difficult to access pipe can be examined from a single location with minimal preparation and while the process is on-line. GWT systems use low frequency guided ultrasonic waves that propagate along the pipe wall and is designed for rapid screening of long lengths of pipe to detect external or internal corrosion.

TIME OF FLIGHT DIFFRACTION (TOFD)

TOFD is an industry norm for pipeline weld inspection. This ultrasonic technique is the best method for defect detection and accurately sizing & monitoring the through-wall height of weld defects.

PHASED ARRAY UT (PAUT)

PAUT is an advanced method of UT that uses a multi-element probe in pitch-catch or pulse-echo mode for applications including weld inspection, corrosion detection and corrosion monitoring. The three main advantages of PAUT systems over standard UT methods are speed, simplicity, and more comprehensive results.

ULTRASONIC TESTING (CORROSION MAPPING)

Ultrasonic corrosion mapping involves scanning the pipeline to determine the minimum remaining thickness for each position and can be achieved using conventional UT probe or a PAUT probe. The systems deployed produce comprehensive, high-quality data that can be displayed in different views to easily identify and/or verify any areas of concern. Sonomatic Inspection Management Software (SIMS) is used to generate 2D and 3D thickness map composites to improve efficiency in data management during the collection phase, and assists in semi-autonomous data analysis and reporting.

DYNAMIC RESPONSE SPECTROSCOPY (DRS)

DRS is a proprietary technology developed by Sonomatic using frequency-based ultrasonic wall thickness measurements. It is a corrosion mapping technique that applies a broad range of low ultrasonic frequencies (<1 MHz) to penetrate challenging coatings such as composite repairs, PE and Neoprene, and excites the natural frequencies of vibration of the underlying steel. The DRS probe raster scans over an area of interest and collects response signals. Advanced signal processing algorithms have been developed to extract the vibration frequencies and map the wall thickness profile.

COMPUTED TOMOGRAPHY - INSPECT™

InspeCT™ is Sonomatic's proprietary subsea computed tomography system designed to eliminate the requirement to remove protective pipeline coatings, specifically concrete weight coating, to evaluate common pipeline integrity challenges including corrosion under insulation/coating, internal pitting & corrosion, degradation of internal linings & corrosion-resistant alloys, and detection & sizing of internal build-up of deposits and scale

ALTERNATING CURRENT FIELD MEASUREMENT

ACFM is an electromagnetic technique for detection and sizing of surface-breaking indications.

It works on all metals, does not require direct contact and works through various thicknesses of coatings. ACFM can accurately detect and size linear indications both length and depth. It is also easier to use on complex geometries such as nodes and nozzles.

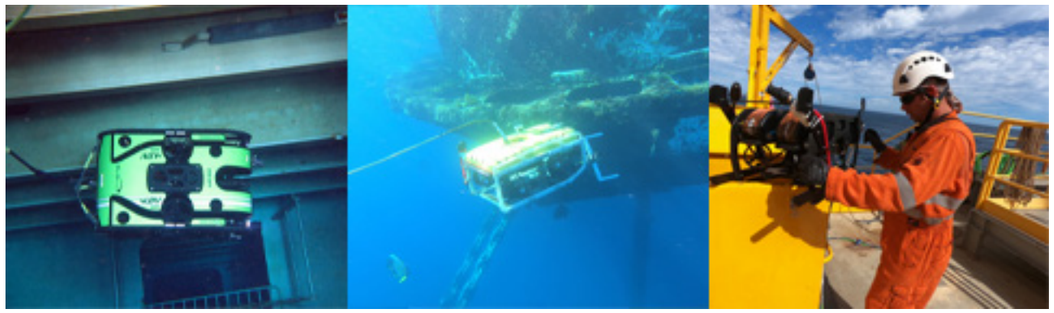
VERTECH GROUP SUBSEA

GEO OCEANS

Geo Oceans is a specialist provider of ROV inspection services and has developed asset deployed ROV technology to provide clients with reliable, safe and cost-effective alternatives to traditional manned inspection, commercial diving or work-class ROV inspection services. Geo Oceans regularly use this cutting-edge technology to complete facility deployed subsea surveys, asset inspections and ocean mapping throughout the globe for many of the largest oil and gas operators.

Geo Oceans works closely with Vertech Group partner, Sonomatic, to implement advanced NDT inspection solutions. Being able to draw on their thirty years of industry experience is an invaluable resource, allowing us to create bespoke NDT tools for our ROV.

Geo Oceans also works closely with Vertech to provide clients with industry-leading turnkey class inspection services on assets under Lloyds Register, Bureau Veritas, ABS and DNV GL classification society guidelines.



BLUE OCEAN MARINE SERVICES

Blue Ocean Marine Services are experts in the planning and execution of offshore surveys, using a wide range of technologies including autonomous survey vehicles. With unrivaled experience in the deployment and management of unmanned survey platforms, we are uniquely positioned to deliver highly practical and cost-effective results. Our systems are lightweight and easily portable, allowing our teams to mobilise in a matter of hours. Once on site our vehicles can be deployed directly from shore or the side of a vessel, eliminating the need for support vessels.

Our Autonomous Unmanned Vehicles (AUVs) are equipped with the very latest sensors, scanners and sampling systems, allowing our team to complete highly detailed site appraisals, subsea inspections and regulatory compliance scopes. Our AUVs can also play a vital role in emergency response efforts such an oil spill or natural disaster by gathering survey data that can emergency response crews.

CONTACTS

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VERTECH GROUP

GEO OCEANS

SONOMATIC

CAPABILITY STATEMENT

GEO OCEANS

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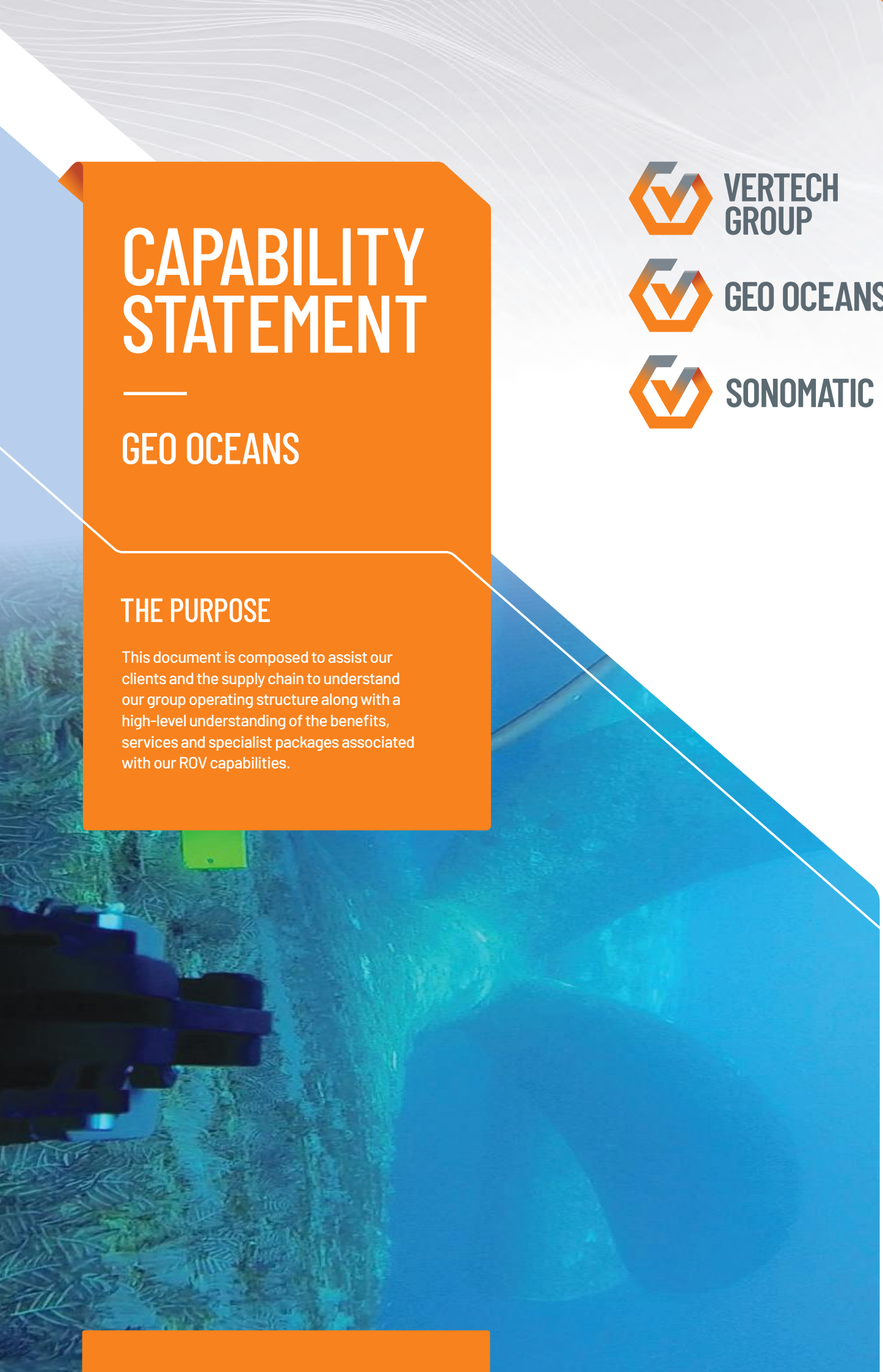

COMBINED SERVICES

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OWNERSHIP STRUCTURE

WE PRIDE OURSELVES ON OUR

CLIENT FOCUS | PEOPLE | SAFETY | QUALITY | INNOVATION

GEO OCEANS

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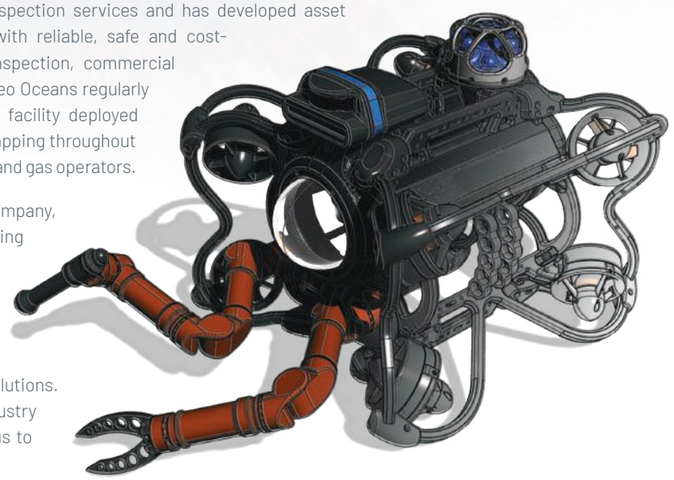

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Group partner, Sonomatic, work with our techs on implementing advanced NDT inspection solutions. Being able to draw on their thirty years of industry experience is an invaluable resource, allowing us to create bespoke NDT tools for our ROV.

GROUP ACCREDITATIONS

- ISO 9001:2015
- ISO 14001:2015
- ISO 29001:2010
- ISO 45001:2018
- ABS Hull Gauging Firm
- ABS Remote Inspection Techniques (ROV)
- ABS In-Water Survey
- BV Thickness Measurements of Hull Structures
- BV Remote Inspection Techniques
- BV In-Water Survey
- DNV Close up Survey
- DNV NDT on Classification Projects
- DNV Thickness Measuring
- DNV In-Water Survey (ROV)
- Lloyd's Register Remote Inspection Techniques (ROV)
- Lloyd's Register Thickness Measurements of Hull Structure
- NATA NDT Inspection

GEO OCEANS SERVICES

WATER BALLAST TANK SPECIAL SURVEYS

Our Mini-ROVs utilise a suite of high-definition cameras, photogrammetry and NDT technologies to collect tank inspection data in a cost efficient, safe and thorough manner. Our tank surveys are all class accredited and meet international standards.

A key advantage of using our specialised asset deployed ROVs is that the inspection can be performed without emptying the tank of fluid. This reduces facility downtime while also avoiding costly and dangerous Confined Space Entry (CSE) procedures.

This service can integrate seamlessly with others offered by our group partners. We have performed many successful campaigns working alongside Vertech's multi-disciplined hull inspection teams, who are experienced in rope access, UAV inspection, NDT and specialised maintenance.

HULL, RISER & SUBSEA INSPECTION

Our ROVs are deployed directly over the side or off vessels of opportunity, eliminating the need for support vessels.

Having the expertise to develop our own proprietary technology, we have many subsea tools that allow us to perform close visual, general visual and marine growth inspections, as well as damage, coating and corrosion analysis.

ADVANCED NDT INSPECTION

Geo Oceans has proven experience in NDT inspection planning, advising clients on NDT methods, and providing solutions to ensure compliance to international standards.

Working with Sonomatic, we can provide a complete collection of NDT services, from commonly used conventional methods right the way up to bespoke advanced solutions. The ROV tools are operated using topside-controlled actuator arms and our technicians have hundreds of hours of flight experience, being able manoeuvre a vehicle with millimetre accuracy.

Our advanced NDT attachments can perform Ultrasonic Testing (UT) and Alternating Current Field Measurement (ACFM). We can also deploy advanced NDT equipment in a payload capacity.

IN-WATER SURVEY/UWILD

Our project managers, ROV teams and asset inspectors work with clients to perform subsea inspection campaigns tailored to suit the specific class requirements and facility needs.

A brand new innovation is our 'link-to-shore' capability which allows clients to see the inspection in real-time. This not only gives the client a completely new understanding of the work we do, it also keeps them much more involved.

Our survey planning process is continually refined to help our clients streamline operations and is key factor in obtaining the most favourable conditions. If weather or SIMOPS should prove an issue, our team are trained to quickly adapt, being able to perform tank and other on-board inspections to still remain useful during delays. Our target is zero downtime.

MARINE GROWTH ASSESSMENT AND REMEDIATION

Geo Oceans conduct detailed jacket structure marine growth assessments and then model predictions of effective marine growth thickness for future periods, supporting asset life extension applications and engineering requirements.

Any areas of the jacket that are covered in marine growth or are badly corroded can be cleaned for coating assessments, CVI, CP, UTM or advanced NDT inspections. Marine fouling can be removed without damaging the coatings or infrastructure, using tools including mechanical scrapers, brushes and high-pressure water blasters.

METROLOGY AND PHOTOGRAMMETRY

Our Mini-ROV inspection systems include imaging technologies for accurate size and area measurements. A camera array (stereo or mono) acquires high-definition video and images that can be processed for scaled measurements and 3D modeling.

The 3D models can be used to calculate size and area measurements for localised corrosion mapping purposes or quantitative assessment of anode remaining percentages. These 3D models can also be compared against the 'as built' (baseline) model of the anodes to create a 'deviation' model that displays the level of material loss.

ROV SPECIFICATIONS

SPECIALIST ROV UNITS

Geo Oceans' ROVs can be deployed anywhere! They are specifically designed to eliminate the need for ROV support vessels and can be deployed from an asset or vessel of opportunity. Each of our ROV systems has a different specialisation and we will work with our clients to deploy the right ROV for the job.

GEO OCEANS RAP-ROV RAPID DEPLOYMENT

The RAP-ROV system is designed for rapid deployments on time-sensitive and low-risk ROV campaigns. This highly portable system can be operated by a small team of highly trained specialists. Speed and size haven't come at a cost of quality as this ROV system contains HD cameras and LED lighting for high quality image acquisition.

- HD visual inspections
- Light cleaning sheltered waters
- UTM NDT
- 15kg

GEO OCEANS CSS-ROV CLASS SURVEY SYSTEM

The Class Survey System (CSS) is Geo Oceans' most versatile asset deployed ROV system. This ROV has the flexibility to perform NDT & cleaning in many hazardous environments and is ideal for internal tank inspections or external jacket, hull, mooring and pipeline inspections.

- Spot cleaning for inspection
- UTM, CP, FMD NDT
- Light tooling
- 30kg

GEO OCEANS ADV-ROV ADVANCED ROBOTICS

This system is the latest ROV technology for projects where dexterity and finesse are critical to the subsea task. The ADV-ROV systems have 5-function robotic arms that can perform fine motor function, making it perfect for controlling highly sensitive NDT tools on the sea floor or on the bottom of tanks.

- Advanced manipulation NDT & cleaning
- Pitch control

GEO OCEANS HPV-ROV HIGH POWERED

Our most biggest and powerful ROV. The HPV excels in campaigns that requires a cumbersome payload, such as light tooling or high-pressure water blasters for bulk marine growth removal. Despite their size, these ROVs can still be deployed from assets or vessels of opportunity.

- Heaviest payload
- Longest excursions

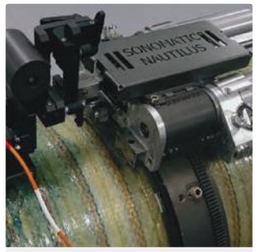
SONOMATIC OVERVIEW

Sonomatic is a worldwide organisation whose expertise in ultrasonic inspection design, development and application dates back more than 30 years to our roots in the nuclear sector. Today the company has widened its focus and provides proven yet pioneering services to customers in defence and power generation, but our largest client base is in the challenging oil and gas industry, both upstream and downstream.

Sonomatic's capabilities for the development of software, systems and scanners, often for bespoke applications, coupled with the expertise of our engineers, means we are among the leaders within this highly specialised field.

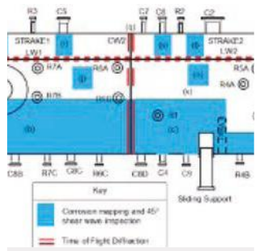
Sonomatic pioneered industrial application of a range of inspection methods now widely used, e.g. Time of Flight Diffraction (TOFD), and continues with active development of innovative inspection and deployment methods that are applied by our own team of experienced field service engineers.

Sonomatic also provides Integrity Services, supporting our clients with planning and evaluation of inspections and using advanced statistical methods to maximise the value of data obtained. Integration of our integrity and inspection services for Non-Intrusive Inspection (NII) benefits the client by allowing vessels and equipment suitable for NII to be identified and reduces the need for costly plant shut downs to assess the internal condition.

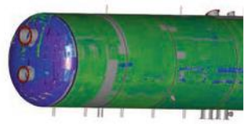


Advanced NDT Inspection

Subsea Inspection



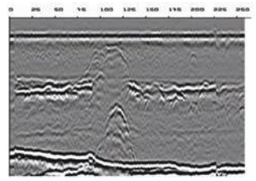
Integrity Services



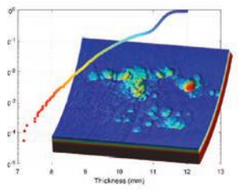
Non Intrusive Inspection

Research and Development

Robotics Inspection



Welding Engineering

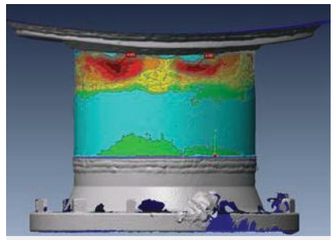


Data Science

VERTECH OVERVIEW

Vertech are a Specialist Access, Inspection and Maintenance provider. We pride ourselves on our client focus with an emphasis on supplying high value, innovative and quality services to achieve excellence in all the projects we execute. We apply world's best practice on the basis of extensive industry experience to excel in industries where safety, quality and reliability are of the highest importance. The core value we place above all others is our care for each other, our clients and the environment.

Project Delivery

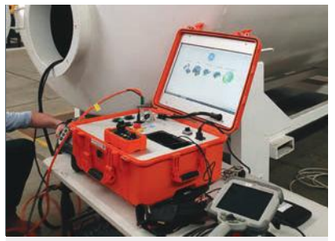


Integrity Management

Specialist Access

NDT Inspection Services

Marine Class Survey



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