SUBSEA SERVICES
Proserv is the fresh alternative in global energy services. We are a technology-driven company providing products, services and bespoke solutions to clients across the drilling, production and decommissioning market sectors.

Combining technical ingenuity with design, engineering, manufacturing and field services expertise, we support clients throughout the lifecycle of their assets with a focus on maximising operational performance and efficiency.

In our ongoing pursuit for excellence, we are not afraid to challenge the conventional. Ingenious Simplicity is at our core and we are committed to helping clients produce more for less. Partnering with progressive, like-minded companies, we cut out unnecessary complexity to provide appropriate, yet ingenious solutions delivered simply.
In-depth expertise for innovative subsea engineering

Proserv provides a broad range of standard and bespoke technology solutions for even the most challenging projects over the life of a subsea field.

We specialise in pre-FEED through to project execution with a focus on IRM services to help maximise the life of subsea assets.

Our problem solving approach allows us to flexibly draw on our large toolbox of subsea technologies and services, encouraging new ways of working that produce outstanding results for our clients. Working within an established competency framework, our engineering experts and technicians can get to the heart of a problem, quickly, delivering a project more safely, efficiently and effectively.

We provide subsea technology and services for clients in the following areas:

**SUBSEA ENGINEERING**
- Rapid response engineering solutions

**LIFE OF FIELD**
- Inspection, repair and maintenance
- Intervention services
- Slot recovery
- Survey services
- Excavation services
- Pipeline services

**DECOMMISSIONING**
- Pre-decommissioning preparation
- Subsea infrastructure severance and removal
- Subsea well severance and removal
EXCAVATION SERVICES

Proserv manufacture and supply a wide range of hydraulically and electrically driven venturi pump dredge systems for subsea excavation from a variety of submerged structures, ranging from harbours to oilfields.

Four times the efficiency of water blasting.

Proserv’s range of dredging systems are designed for the de-burial and clearance of debris, sediment and soil across a range of applications. From subsea pipeline and structure inspection maintenance and repair to decommissioning, as well as other offshore tasks, including drill cuttings remediation and rock dump removal, our systems have been proven to withstand the harshest of subsea environments.

Our range of hydraulic and electric dredging systems start at 100 millimetres and extend to 300 millimetres and can be deployed down to 300 metres water depth. Proserv’s hydraulic dredge systems also have the capability of running an integral water jetting feature to aid in the break-up of stiff seabed material. All systems have the ability to create a vacuum that discharges four times the volume of the inlet flow, creating efficiencies that water blasting cannot offer.

Proserv’s Soil Plug Removal (SPR) tool has been designed to be used in conjunction with Proserv’s R300 subsea dredging system to recover sediment from within the pile. Deployed either by diver or work class ROV, high pressure water is used to aid the breakup of hard sediment and clay soil types.

- Controlled horizontal, downstream discharge location provides zero loss of visibility
- Unrestricted, stabilised flow systems on suction heads allow for higher rate of suction while eliminating recoil
- Removal rates from 36 metres cubed and up to 100 metres cubed per hour, depending on model
CUTTING SERVICES

Proserv offers a range of subsea cutting solutions that have been developed to cut pipelines, caissons, jackets and any tubular structures. From mechanical saws to abrasive water jet cutting, Proserv has the tools to cut through the toughest materials in the harshest subsea environments.

- **Over 3000 projects completed**
- **Over 100 proprietary tools for solving decommissioning challenges**
- **Over 650 platforms and structures removed**

Proserv’s cutting solutions can reduce overall project time by 15-20%

**Versatility and precision across the cutting range.**

With extensive experience in specialist cutting projects and manipulator development, Proserv offers a comprehensive cutting service within the IRM and decommissioning market sectors.

**Water abrasive cutting**

**JetCut**

Our in-house designed and built JetCut systems use the latest water abrasive cold cutting technology, where abrasive material is mixed with high pressure water to create an efficient cutting medium, at depths down to 500 metres. With a shock free, inert cutting action that leaves no heat affected zones, JetCut is the safest cutting system available.

**Mechanical cutting**

**Diamond Wire Cutting**

The Proserv diamond wire cutting system is ideal for inspection, repair and maintenance, specifically for abandonment and decommissioning projects. Available in several sizes, each tool in the range can be handled and operated by any work class ROV or surface deployed. An independent power supply, coupled with control systems and fine metering optimises efficiency in the cutting process.

**Mechanical Reciprocating Saws**

Proserv’s reciprocating pipe saw is available in a range of sizes and is capable of cutting through a wide variety of flexible risers, H beams and mooring chains. The saw is quick to set up and is ideal for small spaces. This saw can be deployed by diver, operated remotely by ROV, or used in conjunction with surface deployed umbilicals.

**Subsea Machining and Pipeline Preparation**

With a full range of pipe end preparation tools available, Proserv offers cutting, milling and combined beveling of various pipe material types to suit clamp and connector repairs. These tools are easily installed by diver and/or ROV.
MULTI STRING CUTTING

The downhole multi string cutting (MSC) tool uses water-abrasive technology to sever all casing strings in a single operation. Developed from over 15 years of water-abrasive cutting experience in the North Sea and the Gulf of Mexico, the MSC tool has been designed to deploy into, sever and recover subsea or surface wells. With a standardised product, Proserv adapts the approach to operate from vessels, rigs or platforms to provide the severance solution in all scenarios.

Multi string cutting in 4-6 hours.

When cost, project efficiencies and vessel time are all huge factors in determining a project’s viability and success, clients need to have confidence in the well severance solution they have chosen.

Based on Proserv's proprietary and field-proven water abrasive cutting technology, the tool provides complete well severance and significantly reduces well operational time by up to 60%. Proven for cutting from seven inches to 36 inches and capable of cutting at water depths down to 500 metres, the MSC tool offers a superior cutting speed of typically four to six hours cutting time.

Compared to the conventional methods of using mechanical knives or explosives, the MSC tool is a non-intrusive, more controlled and environmentally friendly method.

Key Facts

- Over 200 multi string casing wells severed to date
- When coupled with Proserv’s wellhead retrieval tool, it can lock onto the wellhead to provide a wellhead recovery solution post severance
- Non-intrusive method that prevents the tool from getting stuck in the hole from shifted/dropped casing compared to conventional methods
- Can be deployed from vessel, rig or platform to provide an online and offline solution

- 60% provides complete well severance and reduces in-well operational time by up to 60%
- 500 proven for cutting from 7” to 36” at depths down to 500m
- 200 deployed on over 200 wells reliably, safely and successfully
- 4-6 superior cutting speed of typically 4-6 hours cutting time
Proserv has developed portable friction stud welding technology that can be used offshore and subsea. Due to its cost and operational efficiencies, friction welding is now an essential part of many asset owners’ asset integrity programmes.

The reliable alternative for anode retrofit and topside upgrades.

When it comes to subsea anode retrofit there are two options: very costly and complex impressed current cathodic protection (ICCP) systems or cheap, often over simplified, galvanic anode systems. With friction stud welding, Proserv offers a solution that can be designed to deliver the performance of ICCP systems with the reliability of galvanic anode systems.

As a welded connection, it is more reliable than common clamps and has a much lower profile, making it less liable to in service damage. For large, flat surfaces such as FPSO hulls, or very large tubular members such as windfarm monopiles, clamps cannot be used for anode retrofits, forcing clients to use ICCP systems. Proserv offers a more effective and reliable solution using friction welding to attach galvanic anodes.

This technology also delivers efficiency and cost savings for offshore topside applications, and is typically used for securing new installations such as pipe supports, compressors and handrails. Proserv’s history of developing and delivering this type of technology has allowed for the development of friction welding for tripartite, socket and plug welding. As a result, Proserv can use friction welding on a variety of projects, such as the securing of risers, and cofferdam attachment for crack repairs to vessels and FPSO hulls.

- Over 80 topside and subsea projects completed
- Track record welding studs in the field up to M24 and prototype testing with studs up to M42
- System rated to 3000 metres
- Controlled welding parameters make it highly repeatable topside and subsea
- Electro hydraulic powered system can be fully integrated with an ROV or deployed by divers
MARINE GROWTH REMOVAL

The Proserv Marine Growth Removal (MGR) tool has cleaned over seven hundred piles to date during the installation phase. Used by many leading contractors within the subsea and offshore renewables sector, our complete marine growth removal service produces excellent results every time.

Key Facts

- **640**: 640 monopiles cleaned in the UK alone since 2009
- **200**: Flow rates up to 200 litres per minute, if required
- **8m**: Tooling developed to remove marine growth in piles up to 8m diameter
- **SA 2.0**: Cleans to SA 2.0 standards far faster than diver deployment

90 minutes to a clean surface.

A clean pile surface is critical to efficient grouting operations, but marine growth and other surface debris can affect grout adhesion between a pile surface and transition piece bore. Any delay of more than a few days between monopile installation, transition piece placement and grouting operations can be costly.

Proserv has developed, manufactured and successfully deployed and operated tooling that can achieve the stringent surface conditions set by grouting companies on monopiles in a fraction of the time it takes a team of experienced divers.

Launched and operated from a deck of the support vessel, this sophisticated but easy to operate tool can complete a 360° pile cleaning operation to the required pile depth and be back on deck within 90 minutes. A typical diving team may take 30 hours to achieve the same result.

The tool is easy to launch and is self-locating onto the target pile and, once positioned, self-guides during its cleaning phase. Downtime is minimal thanks to the tool’s smart design and efficient mechanics combined with tried-and-tested high-pressure water jet technology. The tool can be tailored to suit a variety of pile diameters and can be used in various water depths.

- Diverless technology reduces handling and self socks onto the pile and topside storage
- Sea and freshwater compatible, with variable operating pressures up to 2500 bar with flow rates up to 200 litres per minute
- Fast and efficient operation with minimal maintenance and service required
- Can clean inner and outer surfaces
Proserv has developed innovative subsea Pipeline Coating Removal (PCR) tooling using state of the art technology for the complete removal of all coatings from subsea pipelines. Based on 20 years of experience in removing coatings subsea, the PCR tool provides a highly-effective and field-proven coating removal system used in some of the most challenging deep-water projects.

Inspection ready surfaces in four hours.

Proserv offers a range of protective coating removal systems powered by HP/UHP water, designed to remove concrete and other protective coating from pipelines. The system is capable of both linear and circumferential passes with only diver or ROV intervention necessary to cut the re-enforced bars exposed by the coating removal process.

Suitable for pipeline inspection and repair, tie in, hot tap and emergency pipeline repair, the PCR tool can remove any type of protective coating from FBE, concrete weight coat and SPU, to bitumen and coal tar enamel, at water depths down to 600 metres. High pressure multiple jet nozzles produce an ultrasonic, inspection-ready surface finish to SA 2.0 standard, without the need for further grit blast cleaning or wire brushing.

Using fly-by-wire technology to remotely control the tool via a laptop and pipeline crawling capabilities to reduce the number of lifting operations required to reposition the tool, the PCR tool can remove a standard protective coating on a 12 inch pipeline in four hours.

- Used on over 350 routine inspection and emergency repair projects globally
- Designed to remove 360° coating 500 - 1000 millimetres in length
- Capable of working pressures up to 2000 bar
- Suitable for pipelines ranging from 100 - 1200 millimetres diameter
- Subsea pumping option to remove coatings down to 3000 metres
Proserv has a 40 year track record in the design, manufacture and rental of intervention workover control systems (IWOCS) globally. Our IWOCS team has in excess of one million man hours delivering monitoring, control and retrieval projects.

Flexible and responsive IWOCS.

When it comes to IWOCS, we understand that there are major advantages to OEM operators and subsea contractors having a fully flexible choice of options. With both shallow and multiplexed deepwater options available, Proserv’s range of custom built and rental IWOCS equipment provides well control during subsea well installations and workovers.

To ensure our IWOCS can meet exact client specifications and requirements, we ensure that our equipment is fully interchangeable and can be integrated into different types of workover scenarios to suit any tree or intervention system. Custom capabilities and systems are also offered, and our IWOCS is compatible with third party equipment for full flexibility.

We also offer a comprehensive range of rental equipment to assist in offshore campaigns, with most equipment designed and certified for zone 1 and 2 uses. These include HPUs, reeler systems, umbilicals and deck jumpers, deployment baskets, sheaves and emergency disconnect systems - all supported by our highly competent offshore service personnel.

Completing the picture, we can also offer the servicing, long term storage, preservation and maintenance of client owned IWOCS.

- Over 550 monitoring, control and retrieval projects executed
- For operations in water depths up to 3000 metres
- Deployment of equipment and personnel within 48 hours
- All equipment complies with DNV2.7-1, ATEX, PED, API 17G, API 17D, ASME and PUWER ISO13828-7, ISO13828-8, IEE and Norsok
NASDIVE DIVER COMMUNICATIONS

Based on a 20-year track record, Proserv is a global leader in diver communication systems and offers NASDive. The system can be tailored for a wide range of standard and bespoke commercial and military diving requirements, to suit both air and mixed gas diving.

High clarity subsea speech communications.

NASDive is the only fully digital diver communications system available. Unlike other systems on the market, NASDive uniquely offers digitisation of speech subsea. Unique in supporting digital signalling over both copper and fibre umbilicals, NASDive is resilient against the effects of attenuation and noise pickup affecting other systems.

In the event that bell communication is lost with dive control, the system automatically transfers control to the bellman ensuring unscrambled communications with the excursion divers is maintained - a unique safety benefit.

The digital format also allows easy integration of wireless headsets for all supervisors and ship to shore telephone communications for all divers, regardless of location.

- Clear helium speech unscrambling for all locations simultaneously
- Easy upgrade path for existing systems, only two STP required in umbilical, one for redundancy
- System proven to operate over degraded umbilical cores
- Unique communications and unscrambling capability between bellman and excursion divers in the case of lost communications to vessel
- Substantially reduced cabling requirements for vessel and bell
- System is easily expandable and re-configurable by user
- Advanced noise filtering techniques integrated into through water communications
NASNet® SUBSEA POSITIONING

The NASNet® subsea positioning system is an advanced, multi-user, versatile Long Baseline (LBL) positioning system that can simultaneously position unlimited objects with fast updates and no acoustic interference. The versatility of the system means it is ideal for meeting deepwater, construction and general hydrographic survey operations.

Accurate positioning, substantial savings.

NASNet® is an advanced subsea positioning system with a concept similar to GPS. The system employs a broadcast technique to determine accurate range measurements between the calibrated NASNet® array and passive receivers on tracked objects.

NASNet® overcomes the limitations of conventional Long Baseline (LBL) systems, with the ability to simultaneously position unlimited objects at fast update rates with no acoustic interference.

A range of seabed stations, ROV and vessel mounted solutions supports all operational requirements including Dynamic Position Reference (DPR), ROV and structure positioning.

Making use of buoy mounted transmitters, NASNet® is highly accurate over extremely long ranges (up to five kilometres) meaning less seabed assets to install and no need for frequency management. NASNet® provides field-proven operational efficiencies and is designed for long term deployment in deepwater environments.

- Long range and high integrity communications using Acoustic Digital Spread Spectrum (ADS²) signalling
- Supports integration with inertial navigation solutions and sparse LBL capability
- Simple system installation including optional single lift and deployment capability for the installation of NASNet® stations
- Mini and compact versions available for project flexibility
- Patented buoy tracking system
With our diverse portfolio of remote intervention tooling products, our global subsea engineering team is the first port of call for operators around the world. Whatever the challenge, whatever the depth, we have intervention tooling solutions for all offshore projects, available off the shelf or custom-made, to purchase or hire.

**Key Facts**

- **100s** individual tools available across the entire product range
- **20** years experience building ROV tooling solutions
- **150** bespoke ROV tooling projects completed
- **3000** many tools rated to 3000m

**Engineering industry standard tooling and support.**

Because of our proven track record in remote subsea intervention tooling and engineering, Proserv has an extensive knowledge of the most common failure situations likely to affect an ROV tooling operation. Our integrated systems approach produces tailor-made solutions for even the most complex and problematic subsea scenarios.

Many of our remote subsea intervention tool packages have become industry standard across the world, from ISO/API-standard diver or ROV intervention tools, through to custom-built remote subsea intervention tooling. In addition to rental tool pools, we also offer local subsea intervention training and technical engineering support. This means we’re able to provide complete, cost-effective solutions that minimise downtime in deepwater environments worldwide.

As a natural extension of our remote intervention tooling expertise, we also manufacture permanently installed sub-assemblies to client designs and specifications, from intervention panels to equipment and support hardware for subsea christmas trees, manifolds and other subsea structures. The option to interface remote intervention tools with subsea hardware presents an opportunity to streamline procurement processes and minimise costs.

- Cutters and grinders
- Dredging and jetting tools
- Hot stabs
- Lifting
- Pumping and injection tools
- ROV tools and components
- SIT tooling
- Tie-in tooling
- Torque tools and control systems
The complete after-market service.

We have the ability to reinstate old and used components back to their original state. Once used parts have been removed from service, we have the capability to either repair or upgrade these parts. This service can offer quick turnarounds as not all out of service parts need a complete overhaul. We also have extensive experience in providing testing services for subsea equipment. Tests can be conducted to national, international or industry standards or to the client’s own enhanced test specification. Using our purpose-built test facilities we can undertake various types of testing including hydrostatic testing, gas testing, high pressure testing, site integration testing and factory acceptance testing.

We also offer dedicated preservation, storage and maintenance services to support our client held inventory and manage the operational readiness of equipment. With dedicated workshops and external areas, our teams can support all aspects of preservation and maintenance from initial strip, clean and inspection through to engineering solutions and build. We also provide in excess of 36,000 square feet of internal storage and an overspill with an additional 50,000 square feet of external storage space at our facilities for clients looking to store equipment on a short or longer-term basis.

- We service a wide variety of subsea equipment including subsea trees, IWOCS, BOPs, reelers, risers, manifolds and valves
- Provide key services including welding, heat treatment, NSE inspection, machining, quality assurance & control, assembly and pressure testing

Proserv offers a complete aftermarket service for our clients’ assets ranging from planned maintenance programmes through to refurbishment projects, equipment repair, testing and certification.

50,000 sq/ft

Over 50,000 sq/ft of external storage space for short or long term storage

36,000 sq/ft

Dedicated 36,000 sq/ft of internal storage for client equipment

8

Eight dedicated service and client facilities

40

Over 40 years industry expertise
SURVEY SERVICES

With a successful track record encompassing the North Sea, Gulf of Mexico, Brazil and West Africa, Proserv is a market leader in the provision of survey services to the offshore construction industry. Our focus is on providing effective survey and positioning solutions to maximise efficiency and minimise project risk.

Tailored offshore services to meet our client’s needs.

Proserv Survey Services provides a range of survey capabilities from onshore bid support and project planning through offshore project execution to supply of final survey and positioning documentation and data. Using a core team of highly competent staff personnel, we pride ourselves in exceeding our clients’ expectations.

Our survey capabilities include:

- Survey consultancy and support services
- Onshore planning and project management of survey and positioning activities
- Vessel mobilisation and survey sensor calibrations
- Execution of a wide range of survey and positioning offshore scopes
- Delivery of final documentation, data processing and data management
- ROV based seabed survey and mapping
- Structure installation positioning
- Pipeline and umbilical installation support and surveys
- Pipeline inspection
- Spool piece metrology
- Trenching and dredging survey support
- Surface and subsea positioning support
- Rental of third party survey equipment
Our vast experience in the rapidly evolving green energy industry is underpinned by our deepwater installation expertise in the oil and gas sector, which is why we are increasingly becoming the go-to partner for the design, fabrication and offshore deployment of marine energy devices.

Evolving with and for the renewable energy sector.

Proserv’s growing experience in the evolving renewables industry is underpinned by our broad-ranging engineering expertise in the oil and gas industry. Over the past three years, Proserv has delivered over 50 bespoke engineering projects for heavy lift contractors and offshore wind companies globally. Covering all stages of the process from construction through to installation and decommissioning, we offer project design, engineering and manufacturing, onsite project execution and offshore deployment and management services.

Project highlights:

- Developing a suite of marine growth removal tools specifically designed for cleaning various diameter monopiles, inner and outer removals, completing 360° surface cleans in 90 minutes
- Anode attachments for wind farm monopiles using Proserv's friction welding technology without the need for diver intervention
- Met mast removals using bespoke tooling adaptations from our existing suite of technologies
Decommissioning Case Study

Robin Rigg Wind Farm Met Mast Removal

Client: Leading energy company  
Location: Solway Firth, Irish Sea, UK Sector  
Equipment: Airlift dredging tool, JetCut system, external guideband and hole cutter

Background

The client required a solution for the removal of two met mast monopiles within the Robin Rigg wind farm field located in the Irish Sea. In order to complete the project Proserv designed a bespoke tool to overcome various offshore engineering challenges within a tight timeframe.

Project Description

Proserv provided a decommissioning solution by carrying out all dredging and cutting operations for the client, which included the construction of a purpose built external guideband capable of cutting up to 4.3 metres. Trials were carried out at Proserv’s Birchmoss facility, which consisted of full guideband carriage installation and 360° hydraulic rotational tests on the guideband prior to mobilisation.

Scope

The work scope included internal monopile dredging operations, followed by external cutting operations using hole cutters alongside Proserv’s 10k psi abrasive slurry to enable rigging/lifting equipment to be attached.

The purpose-built guideband and cutting carriage was attached to the monopole subsea using a single diver operation and connected to Proserv’s 15k JetCut water abrasive equipment topside by means of a lightweight umbilical. The cutting operations were carried out in two separate stages. The first consisted of the hole cuts, which allowed for shackles to be installed, followed by external subsea cutting operations on the monopile, which completed the work scope.

Conclusion

The quick turnaround and bespoke tool was executed within the short timeframe and the offshore work scope completed on schedule. The client received a fit-for-purpose solution with the experienced personnel onsite necessary to complete the decommissioning works. This is believed to be the first known monopile successfully decommissioned within the offshore renewables sector.
Asset Integrity Case Study

Thunder Horse Platform Cathodic Protection

Client: Major global operator
Location: Gulf of Mexico
Equipment: ROV tooled HMS 3000 hydraulic friction welding

Background

Over 200 anodes onboard the Thunder Horse platform had suffered fatigue related failure and a replacement of the anodes to the hull was required without interrupting production.

Project Description

Proserv’s friction welding technology was used to replace like for like anodes, using an ROV. This was a challenge considering the anodes were 400lb in weight. Extensive testing was carried out in advance to qualify the performance of the friction weld including fatigue, tensile and electrical continuity tests. The installation was completed using the ROV that was permanently on board the FPS and was done in conjunction with other planned ROV operations. This helped save money as no construction vessel was required.

Scope

Proserv’s HMS 3000 hydraulic friction welding system was integrated to a customised ROV tooling package for this work scope. The ROV prepared each location and positioned the anode against the hull. Each 400lb anode required two tripartite friction welds for secure attachment. Continuity was achieved by welding a stud to the existing doubler plates, through a machined hole in the new anode strap.

The final weld was qualified to the client’s specification with programmed weld parameters. Once offshore, the HMS 3000 friction welding system consistently executed the same weld and produced graphs for client record.

Conclusion

This unique method of remote anode replacement, using load bearing tripartite friction stud welds, was an industry first and provided a high integrity connection between the anode and the hull. Its successful completion carries implications for aging FPSOs, platforms, pipelines and vessels worldwide.
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