DECOMMISSIONING OFFSHORE WELLS AND INFRASTRUCTURE

FRESH THINKING AND TECHNICAL INNOVATION TO REDUCE FIELD ABANDONMENT COSTS

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All offshore oil and gas installations must eventually be decommissioned. Increasingly, the pressure is on the operators or licensees of redundant fields and suspended wells to act sooner rather than later.

CHALLENGE AND INNOVATE
As a non-revenue generating activity, decommissioning must be completed at the lowest possible cost that is consistent with safe and environmentally sound practices. As a result, and despite a tendency to be conservative when it comes to changing established practices, the offshore oil and gas industry is realising that it needs to embrace less expensive alternatives to conventional decommissioning approaches.

Today, Acteon is redefining subsea services to reduce the cost of owning subsea infrastructure throughout the life of a field. Our operating companies are known for their innovative subsea products and services; the Acteon field life service team helps our customers to get the best from them by promoting internal and external collaboration across disciplines. The team can design, deliver, project manage and integrate subsea services at any level and during all phases, including decommissioning and post-abandonment.

Our track record for leading change in the way offshore wells and infrastructure are decommissioned is well known. Acteon was the first company to complete rigless multi-client well abandonment campaigns, an approach that fundamentally changed the economics of decommissioning in the North Sea and that has been increasingly adopted elsewhere. Developing new technologies, integrating service delivery and applying fresh thinking continues to underpin how Acteon delivers innovative solutions that can be relied on to minimise the costs of decommissioning.

COMBINING STRENGTHS
Acteon is committed to achieving a 30% reduction in the total cost of ownership of subsea assets by increasing its scope and ownership of all processes. This ambition drives its focus on promoting integrated services as the basis for complete solutions to complex subsea challenges.

The Acteon field life service team pre-packages products and services from Acteon operating companies into integrated services that answer established industry needs. If these cannot deliver the specific outcomes customers expect, Acteon has the people and technologies necessary to create bespoke integrated services. These may combine elements of pre-packaged integrated services with Acteon and third-party products or services.

Customer-specific integrated services are delivered as part of complete Acteon solutions that offer customers a single point of contact, simplified interfaces with the service providers, greater value and lower costs through efficiencies and lower overheads.
SUBSEA DECOMMISSIONING SOLUTIONS
Comprehensive, complementary services integrated for efficiency

1. DESIGN, ENGINEERING AND PROJECT MANAGEMENT
   - A full range of design, engineering and project management services to customise and integrate customer-specific applications

2. PLATFORM WELL PLUGGING AND ABANDONMENT
   - Rigless cutting and pulling of live platform well tubing and casing
   - Abrasive severance and multi-string conductor recovery
   - Rigless well abandonment, including production zone plugging

3. SUSPENDED SUBSEA WELL ABANDONMENT
   - Rigless subsea suspended exploration, appraisal and development well abandonment

4. SUBSEA INFRASTRUCTURE RECOVERY AND DISPOSAL
   - Subsea structure and tree recovery
   - Riser, umbilical and pipeline removal
   - Seabed, cuttings pile and infrastructure surveys, inspections and sampling
   - Mooring system and anchor/can recovery

5. FLOATING FACILITY REMOVAL
   - Floating facility towage and berthing

6. INTEGRATION OPPORTUNITIES
   - Design, engineering and project management services
Generally, the aim of offshore decommissioning legislation is to return the environment around oil and gas facilities to its original condition and to reinstate access for other users of the sea.

The first task for operators undertaking the decommissioning of an offshore oil and gas field is to make redundant wells safe by suspending them. Operators that have suspended the wells in a field, may, in some cases, have to complete the overall decommissioning promptly to comply with national and international legislation depending on local regulations. In other cases, the operator has more discretion about when to complete decommissioning.

**WELL ABANDONMENT OPERATIONS**

Conventionally, operators charter a jackup or a semisubmersible mobile offshore drilling unit (MODU) to suspend subsea wells and then keep the unit on location to perform the final abandonment operations. For offshore platform wells, a jackup MODU is often required to plug and abandon them if there is no platform drilling package. Alternatively for platforms with a drilling package, operators may face significant uncertainty if they have to reinstate or refurbish the existing derrick and associated systems.

Despite the relatively high cost of MODUs or derrick reinstatement, many operators prefer this approach because this equipment is perceived as being able to support the full range of services that may be necessary to address any well problems by, for example, drilling, milling or fishing.

Given the cyclic nature of the offshore business, operators may prefer to wait for a market downturn to drive down spread rates or free rigs from drilling activities to minimise decommissioning costs. As the need for decommissioning becomes more pressing because of, for example, increased regulatory pressure, the availability of low-cost solutions driven by depressed market conditions cannot be relied upon to deliver decommissioning cost reductions. Hence, alternative approaches and technologies are required to deliver sustainably low-cost decommissioning, even during periods of high exploration and production activity.

**ALTERNATIVE APPROACHES, NEW TECHNOLOGIES**

Acteon aims to reduce the cost of decommissioning by thinking differently and developing alternative approaches and new technologies. The rigless methods for plugging and abandoning wells that we have introduced demonstrate the potential of challenging established practices in this way. They have revolutionised North Sea decommissioning operations in the last 20 years.

Rigless methods for plugging and abandoning wells have revolutionised North Sea decommissioning operations in the last 20 years.
Acteon's aim is to combine an in-depth understanding of its customers’ requirements with creative business models to achieve sustainably low-cost decommissioning. Since its formation, Acteon has promoted approaches that have recently been cited by the Oil & Gas Authority in the UK as contributing to reducing decommissioning costs. We provide specialist proprietary services while working with strategic partners to offer more-comprehensive solutions. In line with our proposition, operators are adopting different approaches and challenging previous norms, while we and others in the supply chain are offering new pricing structures, business models and technology.

In addition to plugging and abandoning platform wells, we focus on three aspects of subsea decommissioning: abandoning suspended subsea development, exploration and appraisal wells; recovering and disposing of a range of subsea infrastructure; and removing floating facilities. Our decommissioning solutions enable many offshore wells to be abandoned without the permanent presence of a MODU for subsea wells and can remove the need for a MODU or derrick reinstatement on platform wells. When planning and executing the removal of subsea infrastructure, we strive to use divers methods whenever possible to reduce costs and make the operations inherently safer.

**Challenging Convention**

With the ability to act independently of vessel operators and other contractors, Acteon can take a holistic approach to reviewing work programmes. Breaking down the complete scope of work ensures that we can help our customers to optimise the deployment of the assets necessary for decommissioning, for example, by mobilising a MODU only when its unique capabilities are required.

Acteon builds solutions around proprietary tools and techniques and strives to integrate them to create value. We continually challenge ourselves to find the least expensive ways of achieving our customers’ fundamental objectives. Low-cost options are specified wherever possible, and we use more costly, high-specification assets only when essential to achieve the required technical standard. We have, for example, successfully removed flexible risers using a regular anchor handling vessel, an operation that would conventionally require a more costly construction or dive vessel. Similarly, because we charter rather than own vessels, we are able to achieve the desired technical and commercial outcomes by specifying the right capacity, capability and price point in the vessels we select. We can also design or customise equipment and operating procedures to complete several aspects of the decommissioning work scope from the same vessel, rather than using highly specified vessels, purpose built for expensive greenfield construction projects.

Another approach we use to drive down costs is to promote campaigns that deliver similar scopes of work across fields or for multiple operators. To cost reduction method has been proven to be highly effective for well abandonment operations and, we believe, equally applicable for other subsea infrastructure removal operations.

**Our Key Decommissioning Strengths**

Acteon provides full project management services that involve the development of innovative project execution strategies, with the integration of the various skills, products and services necessary to achieve outstanding project outcomes for clients. We provide an in-depth knowledge of the quality, health, safety, environmental, technical, operational, equipment, logistical, planning and commercial dimensions of projects that we deliver.

**Rigless Platform Well Abandonment**

Acteon has been involved with the decommissioning of more than 60 North Sea platform wells, in most cases, without using a drilling rig or a platform crane. We have performed rigless well abandonment on small platforms by chartering jackup lift barges and vessels to support our operations. By combining infrastructure products and services, which include Wellrazer and SWAT™, we create a package that can abandon platform wells completely riglessly.

**Subsea Infrastructure Removal**

We also have many experienced personnel, including geoscientists and riser specialists, and well, drilling, subsea and structural engineers. These people can undertake engineering studies, concept development, equipment design and manufacture, and all the necessary engineering to support offshore operations.

**Floating Infrastructure Removal**

Extensive experience on the on- and offshore aspects of subsea infrastructure installation and recovery gives Acteon the flexibility and expertise to handle even the most complex and unusual decommissioning projects. Using divers techniques wherever possible, we have removed flexible and semi-rigid products that include offshore umbilicals, risers, gas lift flowlines and mooring systems. We can retrieve production assets such as subsea trees, wellheads and manifolds, and have spooled, cut and disposed of umbilicals onshore.

**Rigless Suspended Subsea Well Abandonment**

Acteon can perform rigless abandonment of subsea wells that have been suspended after setting a primary, permanent reservoir barrier. Our industry-leading SWAT system can be deployed from a vessel and used to perforate the well casing, circulate out any contaminants and place and pressure test the required cement barriers in all the annuli of the well. The wellhead, conductor and casing strings can then be safely cut and retrieved using the same vessel.
The Acteon field life service team is central to the delivery of the group’s integrated services. It is the initial point of contact for customers and helps them to define their objectives. For customers with an appetite for outsourcing more of their decommissioning, we are keen to extend the scope of integration and explore how we can contribute to complete turnkey solutions.

INTEGRATED SERVICES
Acteon is redefining subsea services by bringing alternative approaches and new technologies that create value and savings. The integration of decommissioning services and our willingness to propose new business models and offer pricing structures can amplify these savings. Any cost reduction helps operators to undertake timely decommissioning, which removes liabilities from the balance sheet and reduces the risk that well integrity problems will accumulate.

Our cross-disciplinary expertise has the potential to create valuable synergies that bring our customers’ operating units and teams closer, increase the utilisation of equipment, optimise the use of vessels and rigs, improve scheduling and reduce offshore headcounts through the deployment of multi skilled crews. Multi-client campaigns are, for example, proven to bring significant commercial and technical benefits to our customers.

Integrated services for rigless platform well abandonment combine proprietary well decommissioning and recovery services with third-party services to plug, abandon and remove platform wells efficiently. Innovative integration of subsea decommissioning tasks may provide similar benefits that cannot be achieved with piecemeal operations. For customers willing to outsource larger parts of the decommissioning scope of work, we may be able to group decommissioning solutions to clients rather than maximising vessel utilisation.

AN INDEPENDENT TEAM
The Acteon field life service team is central to the delivery of the group’s integrated services. It is the initial point of contact for customers, helps them to define their objectives and tailors the scope and specifications of each integrated service to meet customers’ challenges. The team introduces customers to the relevant Acteon delivery team lead. It manages relationships and collaboration with and between the Acteon operating companies and the other service providers through an interface who is often a specialist based in the customer’s office. The field life service team can support the delivery of integrated services by providing project and activity management services and can second personnel or recruit contractors, as required.

Because Acteon is independent of traditional contractors and equipment manufacturers, the field life service team can build strategic partnerships on a project-by-project basis as necessary to deliver the best value. This helps to secure the most suitable vessel for delivering each integrated service, anywhere in the world. Independence enables the team to focus on delivering cost-effective decommissioning solutions to clients rather than maximising vessel utilisation.

SMART ENGINEERING DOES THE HEAVY LIFTING
An operator needed to sever and recover well casings and conductors during the decommissioning of a 28-well platform in the UK Central North Sea. Lack of historical information meant that an approach suitable for the fully cemented strings of three casings, a 30-in. conductor cut at mid-water depth and uncemented strings was required.

A multiskilled Acteon crew deployed a SABRE™ abrasive cutting system with engineering developments implemented to sever eccentric strings, control the cutting, verify the cuts, drill, pin, and recover multiple strings up to 175 t; and remove marine growth on location.

Acteon successfully completed the work on all the wells. The client noted that “the team was innovative from the project outset and designed and developed bespoke equipment within tight deadlines”. After the first eight operations, the time required to cut and recover a well had been reduced by 30%.

AN UNCONVENTIONAL APPROACH STEMS SHALLOW WATER OIL WELL SEEP
The Becker 1 well, which is in the surf zone of Summerland Beach, California, US, was one of the first US offshore wells. After being abandoned early last century, it became notorious among beach goers as a source of oil seepage.

Acteon proposed an unconventional but pragmatic approach. We set an 8-ft-diameter cofferdam from a crane barge and drove it through the sand in the surf zone to provide a safe working environment for excavating, driving and cementing a 24-in. pile over the exposed casing.

The well was successfully re-abandoned, and the beach was returned to its natural state in just four days without incident and within the budget. A local environmental group commented, “What a glorious project! Thank you for the wonderful work to make this miracle happen!”

INTEGRATING FLOATING AND SUBSEA ASSET REMOVAL
Acteon provided services over the eight-year life of the Innovator semi-submersible production unit. We designed, project managed, procured, installed and hooked up the 12-leg mooring system, which consisted of suction-embedded plate anchors, chain, connectors and ropes, in 1000 m of water.

After five years of service, we completed a mooring line inspection, changed out all the rig wires and upgraded five of the mooring legs. Simultaneous operations were key to the success of these operations.

In preparation for moving the unit at the end of field life, we modelled the position of the risers throughout their transfer to the support vessel and developed procedures for disconnecting and towing the Innovator to port. We procured rigging and tow equipment for all the vessels and provided our team to manage and execute the offshore operations. During the move, we removed 10 umbilicals and risers and 12 mooring lines before towing the unit to port.
Acteon is an independent group of industry-leading companies with complementary capabilities and strong client relationships. Our operating companies’ character, drive and technology focus are what makes our group unique.

INDEPENDENT AND GLOBAL
Acteon is shaping and leading an evolving global subsea services market. Our focus is on reducing the total cost of ownership of our customers’ critical subsea infrastructure safely and responsibly throughout the life of a field.

Independence enables us to take a unique approach to subsea operations: one unconstrained by the need to maximise the use of manufacturing assets or a fleet of vessels. Consequently, we are free to deliver services that align with our clients’ needs rather than those that serve our business objectives.

We have global strength yet employ local staff with regional expertise to carry out projects. We are represented in all the major offshore oil and gas capitals and are involved in projects in the world’s primary hydrocarbon provinces.

As a trusted global partner, we support our clients by delivering the highest levels of international compliance; outstanding quality, health, safety and environmental performance; a flexible workforce to support projects worldwide; and market leadership in each area of activity.

OUR OPERATING COMPANIES
The Acteon group offers an extensive range of products and services that are developed and sold directly by its operating companies. We have applications that can be used throughout the life of a field, from the pre-development planning through to the development, operations and late-life phases, and decommissioning and post-abandonment operations.

Through integration, we leverage the technologies, combined strengths, unique skills, deep domain knowledge and experience of these companies and tailor them to solve our customers’ challenges.

THE FIELD LIFE SERVICE TEAM
Acteon Field Life Service Ltd, a subsidiary of Acteon Group Ltd, was created to focus the creativity of Acteon operating companies and strategic partners on providing service-oriented solutions with simplified interfaces and a high degree of innovation. Our goals are to deliver the outcomes customers need through new and disruptive commercial and technical offerings that lower costs, increase operational efficiency and overcome unresolved challenges in subsea asset ownership throughout the life of a field.

The Acteon field life service team develops and delivers customer-specific integrated services that address complex challenges by promoting collaboration and connecting skills, technologies, products and services wherever they exist. It combines and packages infrastructure and insight products and services to realise specific subsea engineering projects of any scale. The team’s unique combination of subsea specialists and partners within Acteon and third parties enables it to recommend only what is necessary to answer a customer’s service integration needs.

INNOVATIVE SOLUTIONS
We aim to reduce the cost of owning subsea assets through the integration of products and services. Our customer-focused solutions offer a high degree of flexibility, exceptional service quality and fresh thinking. They may be based on complete pre-packaged integrated services or combine elements from more than one existing or bespoke integrated service. They are typically offered with conventional pricing or on innovative commercial terms tailored to the scope of work and the specific customers’ needs. Terms vary from conventional time and materials to lump sum and may share risk and reward.
THE ACTEON PORTFOLIO – REDEFINING SUBSEA SERVICES
Contact the Acteon field life service team if you need a solution that combines Acteon products or services.

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