UPSTREAM

Well Abandonment

Simplify your operations with our turnkey abandonment solutions
Baker Hughes, a GE company (BHGE), integrates proven technologies and expertise with seamless job planning and execution to maximize efficiency and improve the reliability of your well abandonment operations.

**Integrated execution models**
We can manage the entire project—including planning, coordination, and execution. The level of support is flexible and scalable, and can be tailored to your needs—from single services to fully managed turnkey projects.

Allowing BHGE to manage all aspects of your abandonment operations lets you benefit from the synergies that we can bring across the campaign planning and execution phases. Furthermore, you can focus your resources on revenue-generating activities.

**Flexible commercial models**
Our flexible commercial models offer a true partnership with risk-sharing and deferred-payment models that give you the opportunity to reduce your project risk and financial exposure.

**Mastering complexity**
We partner with customers and service providers to overcome any challenges—from subsurface and wellhead integrity issues, to project economics and increasing global supply chain complexity. We also look at innovation through a broad lens. By applying breakthroughs in one business to solve problems in others, we push technological and performance boundaries.

**Committed to HSE**
Our team is trained and certified in each major functional area of well abandonment operations to ensure full compliance with health, safety, and environmental (HSE) regulations.
Our fully integrated approach ensures that you partner with a dedicated team of experienced professionals who understand all your challenges—technical, economical, and time related—so we can effectively transform the burden of P&A into a seamless, final step in your well’s lifecycle.

BHGE maintains alliances and close relationships with leading vessel and specialist companies so we can further push the technical boundaries of traditional P&A processes—and deliver greater value to you through integrated operations that maximize efficiency and leverage the right technologies.

One-stop shop
BHGE can provide a complete turnkey solution—a customer can give us the keys to their assets and we deal with everything. Put simply, this means we can provide everything you need from one place.

Multi-field/multi-operator campaigns
Our objective is to reduce complexity and deliver cost savings through collaboration, economies of scale, and repeatability. This is critical in realizing the cost savings that industry regulators and operators require. We need to look at new ways to deliver true operational efficiency.

Optimized risk and reward
As with every aspect of oil and gas operations, there are varying degrees of risk to be managed. As BHGE, we can take on substantial infrastructure risk and financial responsibility for larger scopes, including full turnkey solutions for well abandonment.

Aligned incentives
We work with our supply-chain partners to provide the best solution for your needs. We focus on the outcome, as opposed to time and materials.

Flexible financing options
Financial considerations should not be an obstacle to getting the job done properly. We offer multiple financing options including fee-for-service, pay-for-performance, and deferred payments.
Leverage fit-for-purpose technology and maximise efficiency

With a comprehensive, integrated portfolio, we’re able to tailor our approach to your specific asset and objectives. This ensures the right tools are chosen for the job, even when contingencies arise—to help minimize costs, and improve reliability.

BHGE stays in tune with your challenges and local regulatory requirements, so we can ensure high efficiency and reliability throughout operations—from sealing the cap rock to final wellhead removal. Operationally, our goals are always to:

- Decrease the number of trips downhole
- Reduce surface footprint required
- Accelerate deployment methods
- Minimize the removal of steel
- Reduce non-productive time (NPT)

**Well Abandonment**

**Assured well access and control**
Onto the well via completion workover riser, marine riser and landing string and into the well through coil tubing and wireline

**Accurate well-integrity evaluation**
Confirm cement and casing conditions prior to abandonment

**Efficient completion removal and well preparation**
Cut, pull, and remove tubing and casing from the well with fewer trips

**Reliable barrier installation**
Install and confirm placement of mechanical and cement barriers

**Effective wellhead and conductor removal**
Safely and efficiently remove tubing, casing, conductors, and subsea wellheads
CASE HISTORY

Mastiff RIS completed casing recovery during simultaneous operations

**CHALLENGE**

- Complete conductor recovery on over 30 wells in the North Sea
- Aged conductor strings unable to support self-weight
- Cemented casing strings required to be cut and pulled together
- Simultaneous operations with platform drilling derrick

**SOLUTION**

- Recommended the Mastiff™ rigless intervention system (RIS), which operates independently of a rig, and has the ability to quickly and efficiently pull all casing strings and skid between well slots
- Enabled tubulars to be picked up and laid down without the need for a crane
- Designed customized fluid-handling system, and lightweight external conductor-cleaning unit

**RESULTS**

- Enabled effective casing boring, pinning, and cold-cutting operations
- Reduced the number of runs by using a downhole motor and multi-string cutter to cut multiple casing strings in a single trip
- Provided safe handling of all contaminated fluid returns
- Reduced headcount on the platform with integrated operations and multi-skilled personnel
CASE HISTORY

WASP system efficiently abandoned four subsea wells, saving $2 million in rig costs.

**CHALLENGE**
- Deployed a wellhead-abandonment straddle packer (WASP) system to place an environmental plug in each well.
- Offered an integrated approach, including multiple services with experienced personnel in each discipline: wellbore intervention, tubing-conveyed perforating, cementing, and project management.
- Coordinated operations with vessel operator, and wellhead severance company.
- Removed water-based and oil-based mud from annuli with specifically designed spacers and flushes before placing the required cement plugs for long-term environmental isolation.

**SOLUTION**
- Successfully abandoned all four wells in less than 23 days.
- Avoided an estimated $2 million in rig costs, and completed project faster than if it had been with a rig.
- Improved efficiency and job execution through integrated project management and coordination of third-party vendors.
- Reduced costs and surface footprint by omitting the need for semisubmersible vessel and riser.

**RESULTS**
- Environmental plugs were needed to complete the full abandonment of four suspended subsea wells.
- Required the placement of a shallow cement plug across annuli, followed by severance and removal of wellheads 10 ft (3.1 m) below mud level.
CASE HISTORY

Well Access equipment and services for 30-well P&A campaign

CHALLENGE

• Recover 12 BHGE and 18 non-BHGE tree and tubing hanger systems
• Limited availability of tree and wellhead equipment records
• Limited availability of tree and wellhead tooling assets
• Non-BHGE tree and controls interfaces
• Busy mobile offshore drilling unit (MODU) decks
• Difficulty establishing verified communication with tree and wellhead

SOLUTION

• Early engagement
• Clearly defined interfaces
• Developed an integrated solution with our completion and workover riser (CWOR) and intervention workover control system (IWOCS) to deliver well access and tree control across BHGE and non-BHGE systems
• Engineering review and support
• Expansion of tree and well tooling availability

RESULTS

• Successful access and abandonment of 30 subsea wells
• Conducted within budget with zero lost-time incidents
• Supported delivery of the overall P&A campaign which was completed five months ahead of schedule
Well Abandonment

Together, we can improve your outcomes

• Simplify operations
• Increase efficiency
• Reduce time
• Reduce cost
• Improve reliability
• Deliver industry-leading solutions

For more information:
bhge.com/abandonment