



# WELL ABANDONMENT

Comprehensive Plug and  
Abandonment Systems



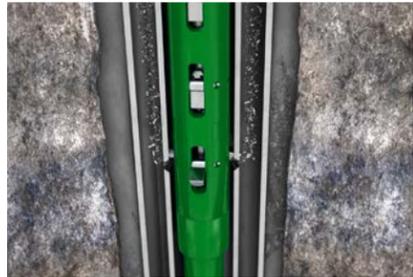
# Complete, single-trip systems for P&A

Wellbore Integrity Solutions comprehensive plug and abandonment systems bring certainty and rig-time savings to your P&A operations.



Wellbore Integrity Solutions designs P&A systems that deliver the most effective, trip-saving technology in the industry. We focus on creating reliable technology that will enable our customers to complete P&A processes in a single trip, increase certainty, and reduce NPT.

Our systems cover the milling and underreaming, casing cutting and pulling, and wellhead retrieval processes. From achieving rock-to-rock zonal isolation to latching onto the wellhead for recovery, our P&A systems support time and money savings across the board.



### SINGLE TRIP TO CUT AND RETRIEVE CASING

The ProCISE\* casing cutting and recovery system performs multiple casing cuts and engages casing for removal—all in one operation.



### SINGLE TRIP TO MILL AND UNDERREAM

Combining a bridge plug assembly, an underreamer, and a section mill in a single-trip solution, the ProMILL\* trip-saving milling and underreaming system achieves rock-to-rock zonal isolation and prepares the foundation for an abandonment cement barrier.



### SINGLE TRIP TO RECOVER THE WELLHEAD AND SURFACE CASING

The ProLATCH\* wellhead retrieval system enables cutting and latching onto the surface casing and removal of the surface casing and wellhead, all in a single trip.

**Abandon Your Well.  
Abandon Uncertainty.**

## ProCISE

### Casing cutting and recovery system

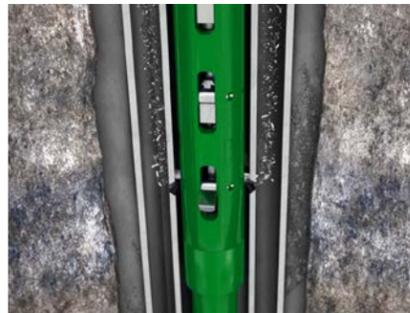
#### Efficient casing engagement, cutting, and recovery

Another member of the highly efficient Wellbore Integrity Solutions plug and abandonment family, the ProCISE system alleviates costs accumulated from multiple casing cutting and recovery runs. In one operation, the system severs casing, provides efficient circulation, and engages casing for removal.

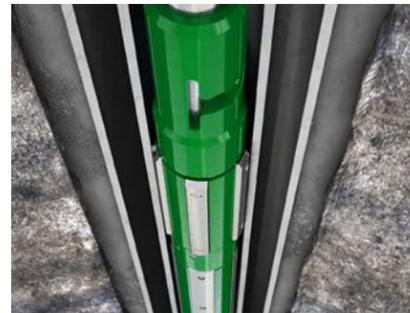
The multicycle pipe cutter has three sets of blades that can perform multiple casing cuts during a single run, avoiding extra rig time in applications where multiple casing cuts may be required.

Once the cut is successfully confirmed, the ProCISE system engages the in-line casing spear and latches onto the end of the casing segment to be removed. This procedure enables hanging the recovered casing in the rotary table, leaving the casing to be handled more safely and efficiently as it is removed from the wellbore.

In addition, the system has a hydraulic pack-off, making it possible to circulate the annulus free from any settled solids or barite sag. Other system components include a Hydra-Stroke\* bumper sub, a conventional bumper sub, and a mud motor.



The multicycle pipe cutter offers contingency cutting capacity by enabling multiple cuts to be performed, saving valuable rig time and reducing HSE exposure to rig crew with less handling at the surface.



When the in-line casing spear is engaged, an overpull check is performed. Once a secure latch is established, the casing can be cut in tension to enable a faster cut.



### Single Trip to Cut and Retrieve Casing

Deliver cost savings—especially in challenging deepwater environments.

## Single Trip to Mill and Underream

Save rig time, improve ROP, and ensure plug integrity for confident P&A decisions.

## ProMILL

Trip-saving milling and underreaming system

### Effective foundation for an abandonment cement barrier

The industry-unique ProMILL system enables consistent savings during P&A operations by delivering in a single run what takes conventional methods four trips to accomplish.

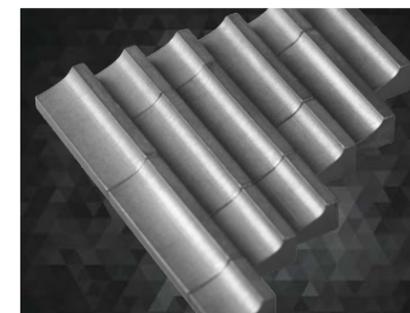
The ProMILL system combines a bridge plug assembly, a section mill, and a high-ratio underreamer to prepare the foundation for an abandonment cement barrier in a single run. During the run, it eradicates all leak paths from the abandonment barrier while achieving rock-to-rock zonal isolation.

All ProMILL system cutter arms are dressed with the WavEdge\* ridged milling element that, along with the multiblade design, provide high ROP and maximum footage. This unique milling element, designed with a concave pattern and narrow leading edge, has improved durability, stabilization, and results in superior hole cleaning and swarf quality.

The high-ratio underreamer features ball-drop activation, which ensures that the reamer remains inert during the entire milling operation. The section is underreamed and the operator achieves the target access, completing the operation.



The system incorporates a bridge plug running kit that enables a mechanical plug to be set without prematurely activating the section mill or underreamer.



The section mill is dressed with the WavEdge element. This newly designed milling element has improved durability, delivers higher ROP through enhanced milling stabilization, provides more efficient wellbore cleaning, and optimizes swarf size to improve separation at surface.



# ProLATCH

## Wellhead retrieval system

### Simpler and more reliable wellhead recovery

The ProLATCH wellhead retrieval system simplifies mechanical abandonment operations. When a subsea well has been successfully isolated and the wellhead and guide base must be removed for site restoration, the ProLATCH system recovers the surface casing and the wellhead in a single trip.

The system is ideal for offshore operations because it eliminates the need for weight transfer to a marine swivel, compression-cut BHA. This minimizes the risk of fatigue failure by reducing rotating, bending, and bowing in the workstring.

When the wellhead spear is engaged, it is possible to apply an overpull to assist with tension cutting operations. By having an engagement point immediately above the cutter assembly, the system prevents undesirable BHA movements which could result in a failure to achieve the cut. After the casing strings are severed with a high-performance hydraulic pipe cutter, the wellhead spear remains engaged to recover the surface casing and the wellhead.



The casing is severed mechanically and the wellhead spear remains engaged for a simultaneous retrieval of the casing section and wellhead.



Robust, hydraulic pipe cutters cut the casing string internally, creating a reliable cut.



### Single Trip to Recover the Surface Casing and Wellhead

Achieve reliable and stable wellhead retrieval operations—without the risks of fatigue failure associated with compression cut systems.

## Case Studies: Comprehensive Plug-and-Abandonment Systems

### PROCISE SYSTEM SAVES TWO TRIPS IN DEEPWATER GOM

#### Challenge

Reduce rig time needed to cut, pull, and circulate around 9 $\frac{5}{8}$ -in casing known to have annular solids and gas on a deepwater operation in a GOM brownfield.

#### Solution

Run ProCISE system comprising multiple components integrally designed to perform the P&A operation in a single run.

#### Results

Retrieved wellhead seals on BHA without needing an extra trip, cut casing free and circulated out trapped gas and packed annular solids in a single trip with established well control, and maximized casing recovery to ensure whipstock setting depth complied with the new sidetrack drilling program.

### PROMILL SYSTEM ELIMINATES TRIPS AND SAVES MORE THAN 3 RIG DAYS, NORTH SEA

#### Challenge

Set bridge plug, mill and underream 150-ft window in 9 $\frac{5}{8}$ -in casing to enable rock-to-rock barrier placement in a single-trip P&A operation.

#### Solution

Use ProMILL system with the WavEdge element to eliminate up to 3 dedicated trips to surface.

#### Results

Set 9 5/8-in bridge plug from a taper mill, displaced and conditioned the well, milled at an ROP of 4.5 ft/h and underreamed a 150-ft section, and completed window in a single run. Completed window in a single 50-h run, saving 3.5 rig days and USD 600,000.

### PROLATCH SYSTEM SAVES USD 600,000 IN P&A OPERATION OFFSHORE WESTERN AUSTRALIA

#### Challenge

Recover wellhead and casing string in deepwater P&A operation.

#### Solution

Use ProLATCH system to retrieve the wellhead and surface casing together to simplify the abandonment operation.

#### Results

Severed the casing strings below the mudline, recovered the wellhead, and saved 12.5 h and USD 600,000.



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