

A while ago I wrote about subsea plug and abandonment using Light Well Intervention Vessels (LWIVs), with a central premise: conventional rig-based P&A is not economically sustainable at scale, and meaningful cost reduction depends on technology and new ways of executing the work.

That premise still holds.

What continues to evolve is not the regulatory framework or abandonment fundamentals, but the capability set available to support abandonment—and the confidence with which those capabilities are applied across subsea portfolios.

This article builds on that earlier thinking, outlining how developments in intervention, pressure control, well integrity, and execution strategy have expanded what can realistically be achieved without defaulting to a drilling rig.

What has not changed

Some fundamentals remain unchanged:

- No two subsea wells are identical
- A subset of wells will always require drilling rigs
- LWIVs are not a replacement for MODUs
- Abandonment must remain barrier-driven and regulator-compliant

What *has* shifted is the number of wells that automatically fall into the “rig-required” category—often driven by legacy execution logic rather than technical necessity.

Which Subsea Abandonment Phases Truly Require Rigs?



Barrier-driven execution, phase by phase

Reservoir Abandonment (Primary Barriers)	Intermediate Abandonment	Tree & Wellhead Phase	Final Removal & Clearance
<p>Execution Fit: CONDITIONAL</p> <ul style="list-style-type: none"> • Permanent reservoir isolation • High pressure containment • Full-bore access may be required <p>Typical Approach:</p> <ul style="list-style-type: none"> • LWIV / RLWI where pressure & integrity allow • Drilling Rig where heavy milling or complex access is required <p>Bottom Line: Rig required for a subset of wells</p>	<p>Execution: Often INTERVENTION-LED</p> <ul style="list-style-type: none"> • Secondary barriers • Annulus / casing isolation • Preparatory cleanouts <p>Typical Approach:</p> <ul style="list-style-type: none"> • LWIV / RLWI • Wireline or Riserless CT • Targeted integrity remediation <p>Bottom Line: Rig escalation is condition-based, not automatic</p>	<p>Execution Fit: NO RIG REQUIRED</p> <ul style="list-style-type: none"> • Subsea tree recovery • Wellhead preparation • Conductor severance readiness <p>Typical Approach:</p> <ul style="list-style-type: none"> • Light construction vessels • Decommissioning support vessels <p>Bottom Line: Mechanical removal, not well intervention</p>	<p>Execution Fit: NO RIG REQUIRED</p> <ul style="list-style-type: none"> • Wellhead & conductor recovery • Guide base removal • Seabed clearance <p>Typical Approach:</p> <ul style="list-style-type: none"> • Decommissioning vessels • ROV-based cutting & lifting <p>Bottom Line: Lowest-cost capable vessel</p>

Key principle: Rigs are required where well risk, pressure envelope, or mechanical scope exceed intervention capability not by default, but by necessity.

All phases remain barrier-driven, verified, and regulator-approved on a well-by-well basis.

Early enablers: maturity rather than novelty

Several enabling technologies referenced in earlier discussions—such as open-water tubing recovery and subsea isolation concepts used within RLWI ecosystems—are now well established. They demonstrated that long-standing limitations of Riserless Light Well Intervention could be addressed.

What has changed is not their existence, but how they are applied. Experience gained from selective use has led operators to position these tools more deliberately, typically within phased abandonment strategies rather than as standalone solutions.

This, in turn, has supported clearer internal barrier philosophies and more structured regulatory engagement on a well-by-well basis.

Lightweight pressure control for abandonment contexts

One of the more tangible developments has been the **development and positioning** of lightweight, modular pressure-control systems intended specifically for intervention and abandonment contexts, rather than drilling or full workover operations.

These systems are generally:

- sized for abandonment pressure envelopes
- capable of mobilization on monohull intervention vessels
- compatible with wireline and riserless coiled tubing
- intended to reduce escalation to rigs driven purely by pressure-control requirements

When applied in appropriate well conditions, such systems can allow portions of reservoir and early intermediate abandonment to remain vessel-led.

Riserless intervention systems: capability consolidation

Riserless Light Well Intervention systems have continued to evolve, with increased emphasis on lighter, modular architectures suitable for P&A and late-life well operations.

Recent development has focused on reducing system weight, simplifying pressure-control interfaces, and improving compatibility with intervention vessels rather than drilling units.

These developments reflect a broader shift toward right-sized intervention systems—expanding the range of wells and abandonment phases that can be executed vessel-led, without attempting to replace drilling rigs wholesale.

Well integrity remediation as a precursor to abandonment

Another important shift has been the treatment of well integrity remediation as part of abandonment planning, rather than solely as a reactive escalation trigger.

Where integrity issues such as micro-annulus, casing leaks, or poor cement isolation might previously have forced heavier intervention, operators may apply targeted remediation techniques to stabilize wells ahead of abandonment execution.

Integrity remediation can be enabled by a range of rigless-capable barrier and sealing approaches—mechanical, resin/sealant, and verification or monitoring-based—offered by multiple providers across the sector.

In practice, stabilizing the well first can be a key enabler of rigless or vessel-led abandonment.

Specialist barrier and integrity solutions

Alongside developments by established service companies, there has been growth in specialist technology providers focused on barrier placement, integrity remediation, and abandonment-specific challenges.

These solutions tend to address discrete well problems rather than applying broad, rig-centric approaches—supporting a more selective, condition-based execution strategy.

In parallel, monitoring and verification technologies have expanded to improve visibility of well behavior during temporary or phased abandonment. While such tools do not replace conventional barrier verification, they can support decision-making in specific contexts.

Riserless Coiled Tubing and intermediate abandonment

Riserless Coiled Tubing has matured as a complementary intervention method and is increasingly evaluated alongside wireline for abandonment-related scopes, including circulation-dependent operations, spot cementing, cleanouts, and preparatory work.

Used selectively and within known limits, it can expand the intermediate abandonment scope achievable from intervention vessels, while respecting constraints related to vessel motion, deck space, and pull capacity.

Abandonment phases that do not require LWIVs

It is equally important to recognize that not all phases of subsea abandonment require an LWIV.

Once reservoir and intermediate abandonment objectives have been met and verified, much of the remaining scope is mechanical rather than intervention-based—such as tree recovery, wellhead and conductor cutting, and seabed clearance.

These activities are often more efficiently executed from light construction or decommissioning vessels, rather than intervention vessels or drilling rigs.

In practice, some of the most meaningful efficiencies are achieved by matching each abandonment phase to the simplest vessel capable of executing the scope safely, compliantly, and with appropriate verification.

Closing thought

LWIV-led abandonment is no longer about proving what might be possible.

It is about measured, selective application—supported by a broader and more mature capability set.

The challenge is not inventing new tools, but applying existing ones in the right combinations, well by well, to deliver abandonment programs that are technically sound, regulator-compliant, and economically sustainable across subsea portfolios.