Summer 2026

SPE Review London

The official e-magazine of the SPE London branch

SPE International London Section

Solutions. People. Energy.℠

Building capable teams and robust operating systems that perform under pressure – C-Level Talk: Lorna Blaisse, CEO Helium One Global

- SPE London football tournament, June 2026
- AI uncovers four new prospects in Guyana
- Women in Energy 2026: See you in September
- Talos Energy: What makes a good E&P CEO?
- SPE London Energy Cup, September 2026
- Improved PWC methodology applied to a plugging and abandonment job in offshore UK

Plus: News and SPE events, both local and international

SPE SECTION EXCELLENCE AWARD 2020

50 YEARS

SPE Review London

The official e-magazine of the Society of Petroleum Engineers' London branch

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In this issue

FEATURES

Photo credit: Unsplash

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Behind the Scenes: SPE Review Editorial Board

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Letter from the Editor

Dear SPE London members,

Welcome to the Summer 2026 issue of SPE Review London.

We open this issue with a fascinating C-Level Talk with ***Lorna Blaisse, CEO of Helium One Global***, covering her transition from oil and gas geology into helium, her move from Principal Geologist to CEO, and her experience leading the company through drilling, capital markets, and technical uncertainty (pp.7–9).

We then include a short piece on '***AI in exploration***', looking at ExxonMobil's use of Stabroek Block data in Guyana to identify four new prospects not previously mapped by geoscientists (p.10).

This issue also features an article on '***What makes a good E&P CEO***', comparing founder-led experience with Big Oil experience through the Talos Energy's transition from Tim Duncan to Paul Goodfellow (pp.12–19).

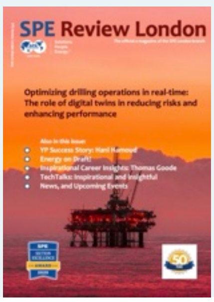
Our technical paper covers '***Improved PWC methodology applied to a plugging and abandonment job in offshore UK***', including a hybrid jet- and cup-based PWC tool, CFD modelling, mechanical perforations, and cement barrier verification (pp.21–34).

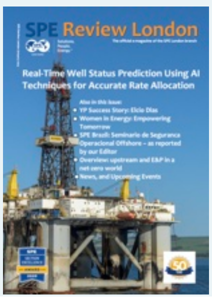
On the SPE London side, we look back at the ***SPE London Football Tournament***, held in June at Powerleague Battersea and followed by Energy on Draft (p.6). We also include the upcoming '***Women in Energy***' seminar on 9 September (p.11) and the '***SPE London Energy Cup***', taking place on 24 September (p.20) – do not miss out!

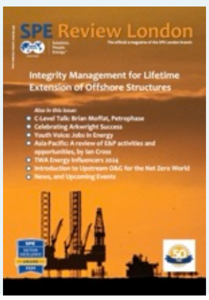
Thank you to all authors, interviewees, volunteers, sponsors and board members who contributed to this issue.

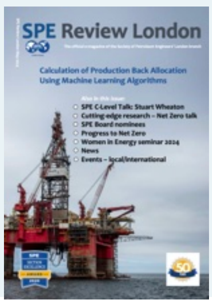
As always, if you have an event write-up, technical article, field lesson or career perspective that would be useful to SPE London members, please send it through.

Warm regards,
Elizaveta









NEWS DIGEST… NEWS DIGEST… NEWS DIGEST

Half a century!

Congratulations to SPE London branch member **William R. McNeary** for his induction into the 2026 SPE Legion of Honour.

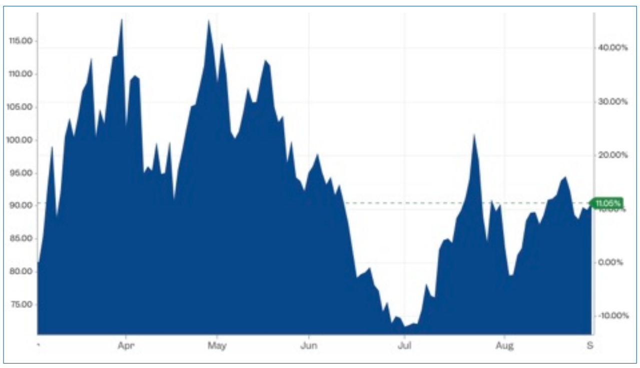
This year, SPE welcomed 261 members into the Legion of Honor, which recognises 50 years of consecutive membership in the Society.

Members in the Legion of Honor are exempt from membership dues. They also receive a commemorative certificate and lapel pin in honor of their achievement, free registration for all SPE Annual Technical Conference and Exhibitions, and recognition in the Journal of Petroleum Technology.
Read more

New appointments at Harbour Energy

Graeme Davies is appointed as Managing Director of its UK Business Unit, effective 1 October 2026.

Graeme succeeds **Scott Barr**, who has been appointed Managing Director of Harbour's Mexico Business Unit and will relocate to Mexico City from 1 November 2026.
Read more



Oil (Brent) Open 89.45 on 31 August 2026
[52-week low: 58.72/52-week high: 126.41]
(Credit: Business Insider)

MSU services offshore Brazil

Floatel International has received a letter of intent (LOI) for the 2016-built Floatel Triumph vessel to provide maintenance and safety unit (MSU) services offshore Brazil.

Floatel Triumph is designed for worldwide operation with emphasis on some of the harshest environmental conditions in the world.

The MSU assignment, which is for four to eight months, is scheduled to begin in Q1 2027.
Read more

Potential for significant development?

Latin America companies Petroleo Brasileiro and Petroleos Mexicanos have teamed up to explore to a geologic cluster off the coast of Mexico's Campeche state.

Teams from both companies have begun assessing seismic and other geologic data.
Read more

Technology innovation

Baker Hughes has agreed a multi-year contract with Kuwait Oil Company to accelerate technology innovation in the country's upstream energy sector.

The collaboration will focus on developing and deploying scalable, fit-for-purpose technology solutions to optimize production and flow assurance. As part of the agreement, Baker Hughes will build a research and technology development center in the Ahmadi Innovation Valley. Baker Hughes has been in Kuwait for more than four decades.
Read more

SPE London Football Tournament, June 2026

The SPE London Football Tournament 2026 was a wonderful opportunity to connect with colleagues from across the energy industry through sport, networking, and community engagement. The summer tournament (held on 6 June) was sponsored by the SLB Integration Team, whose support helped bring together professionals and students from across the sector for an exciting day both on and off the pitch.

The Saturday afternoon event was at the Powerleague - Battersea football venue in London. The friendly – yet competitive – football matches included professionals, students, and company teams from across the energy industry.

Following the exciting sports event, there were further networking opportunities at the Energy on Draft evening event at the The Duchess Belle Pub, also in London.

See page 20 for the SPE Energy Cup!

Building capable teams and robust operating systems that perform under pressure


Lorna Blaisse

Lorna Blaisse is the CEO of Helium One Global Ltd, an AIM-listed company advancing the development of two helium projects across Tanzania and the USA.

She is a skilled explorationist with 17+ years of oil and gas experience in Africa. She successfully led exploration drilling campaigns in East and Central Africa, and has extensive geological knowledge of the East Africa Rift System.

Who is Lorna Blaisse? Please tell us about yourself.

I worked in the oil and gas industry for 15 years on Africa-focused projects before transitioning over to helium, a commodity that is increasingly important to advanced technologies, healthcare, space exploration and semiconductor manufacturing.

I am a geologist by background with a master's degree in Petroleum Geoscience from Royal Holloway, University of London and a Fellow of the Geological Society of London.

I live in the UK and am a mum to two energetic boys and a less-energetic Labrador! Life is busy, but in the rare moments I am not working or being mum, I enjoy the outdoors and will be outside as much as I possibly can.

You started your career at Tullow Oil, where you worked the Southern North Sea and several African markets. What attracted you to geology in the first place, and what did those early years in the field teach you that you still use today as a CEO?

Interestingly enough, I didn't set out to be a geologist and originally wanted to study veterinary medicine, but decided I would get too emotionally attached to animals, so working with non-emotive rocks instead seemed like the more sensible option!

I had great mentors at University and was also very fortunate to have been provided with a good foundation at Tullow where I was exposed to many opportunities over a relatively short space of time. Although the North Sea is an excellent training ground for all geoscientists, it was the exposure to Africa that broadened my perspective and reinforced a principle that remains central to my leadership today: complex projects require curiosity, resilience, and a willingness to make brave and informed decisions in uncertain environments.

In 2023, you went from Principal Geologist to CEO almost overnight, just as Helium One was preparing for a critical drilling campaign. How did you approach taking responsibility for the whole company rather than simply the technical decisions?

Yes, these moves from the outside looking in always appear sudden but – in reality – there is usually a transition. I had been the company's Principal Geologist for two years and knew the Tanzania project well, had regularly presented to the Board and understood the significance of the exploration campaign ahead. I had already gained the geological knowledge of the East Africa Rift Basins early on in my career and, although helium was a new commodity to me, the principals of exploring and developing it are very similar to those in the oil and gas industry.

I believed in the team and knew – with their support and work ethic – that we could make it work. But the responsibility leap to CEO was huge and, even now, I don't ever underestimate that. It is a test of resilience, strength and the ability to remain calm in every situation. However, no CEO succeeds alone; the role is to set direction and strategy, make decisions and ensure the right people are supported to deliver.

What was the steepest part of the learning curve when you became CEO – capital markets, people, government relations, commercial decisions, or something else entirely?

As a CEO of a public company, there is always a delicate balance between delivering the project/business while managing the market narrative and juggling capital constraints which, for a start-up company like Helium One back in 2023, was very much a new challenge for me to manage. However, I am very fortunate to have a supportive Board and a strong team of advisors behind the Company.

I'm also not afraid to acknowledge my gaps and weaknesses, and look to increase my understanding in these areas. In the meantime, I have a team of experienced and competent people who have these strengths and can support me and the Company.

When you moved into the CEO role, what did you initially underestimate about leadership?

Prior to becoming a CEO, I had always considered myself a good people person (hopefully I still am!) but when you are the person doing the leading and the 'go to' person everyone needs, regardless of the day you're having and the long list of tasks you must complete, you must still maintain that status quo of leading and being there for others.

You must always give 100% and show up in a way that is decisive, positive, and inclusive. This requires a lot of energy and strength to maintain, even if it's at 3am and we are in the middle of a drilling campaign, and I guess I hadn't fully appreciated that before.

As a geologist, you are trained to make decisions with incomplete information and uncertainty. Has that way of thinking influenced how you make decisions as a CEO?

Very much so. Geology teaches you to interpret imperfect data, assess risk and remain objective until the evidence is clear. Those skills translate directly into corporate leadership. In exploration and development, as in business, certainty is rarely available at the outset. The key is to understand the range of outcomes, act decisively when the facts support it and remain flexible as new information emerges.

I've also quickly learned that it's impossible to control everything and some decisions are going to have to be made with limited information and with a higher risk profile than you may be comfortable with. However, sometimes they can end up being the best decisions made.

Helium One has gone through quite a transformation: from frontier exploration in Tanzania to a discovery, a mining licence, and now commercial production in the US. What have been the hardest decisions behind that evolution?

One of my first tasks as a new CEO in 2023, was to source a suitable drilling rig for our southern Rukwa drilling campaign in Tanzania. We ended up purchasing an oil and gas type rig in Kenya and importing it into Tanzania. This has been one of the best decisions for the company as it enabled us to fast-track our exploration campaign and advance the project through to development.

However, when the rig experienced technical issues during the drilling of the Tai-3 well, the situation tested the resilience of the team. The recovery that followed demonstrated the value of calm leadership, clear communication and disciplined problem-solving.

What do you see as the most important traits for C-Level leadership and building a team today?

For me personally, I think effective leadership depends on character, judgement and the acceptance of accountability. Technical excellence is essential, but it is not enough on its own. High-performing teams are built by people who take ownership, communicate constructively, and remain solutions-focused under pressure.

I look for individuals who combine capability with integrity: people who understand the wider objective, support those around them and contribute to a culture where ambition is matched by discipline.

You have volunteered in the past as a School Parent Governor and with adults and children with disabilities. Why do you think volunteering is important for young people, and can it influence their career choices and direction?

Yes, absolutely and I would very much like to guide my children towards volunteering. It is such an important early platform for personal development. It is so incredibly rewarding and gives young people the opportunity to contribute, build confidence and develop communication and interpersonal skills in environments outside formal education or employment.

For someone starting a career in energy or geoscience today, what experiences would you deliberately seek out early – and what would you worry less about?

Early on in my development, while still at University, I was fortunate enough to secure several summer placements with leading oil and gas companies. These experiences enabled me to ‘absorb’ team behaviours, observe how people work together in a professional environment (which is very different to a university setting!) while also enabling me to ask myself whether this was the job I would want to make a career out of.

I would encourage that early exposure to all young professionals where possible. And the one thing I would definitely worry about less (in hindsight!) in my early career, would be to not worry about what my overall career trajectory will look like but to break it down into a series of smaller chapters with objectives and goals and see where that journey leads to.

When you identify high-potential younger employees, what qualities make you think they have the potential to become future leaders?

Trust. To be a good leader, people must demonstrate a high level of trust and integrity in order for others to reciprocate and follow their lead.

Good self-awareness by knowing their strengths and weaknesses, whilst remaining open to feedback.

Strong emotional intelligence. They must understand how their behaviour affects others and have a good ability to listen.

Ownership is another. They don’t wait to be told what to do but they see a problem, take responsibility, and drive it through to a solution.

AI uncovers four new prospects in Guyana

ExxonMobil fed all their well, seismic, and reservoir data from Stabroek into an AI model. It identified four prospects their geoscientists hadn't mapped.

During their most recent earnings call, XOM reported that they trained an AI model on their existing Stabroek Block data, then screened the full block for patterns human interpreters may have missed. The model's hindcast accuracy was 90%. It retroactively identified 9 out of 10 known discoveries before flagging the four new targets. None of those four were in the existing prospect inventory.

Stabroek has 30 discoveries and 11 billion recoverable barrels. This is one of the most explored deepwater blocks on the planet right now. Hundreds of geoscientists have worked this data for over a decade. The algorithm still found targets they hadn't flagged.

Pattern recognition at this scale and speed is something human workflows can't match across a dataset this large. Thirty discoveries generate an enormous training set. Most basins don't have that density of calibration points, which is exactly why Exxon could do this in Guyana first.

The challenge is what happens when companies apply these models to basins with fewer wells and less data. Guyana was the easy case. The real test is whether AI can identify prospectivity in frontier acreage where the calibration is thin and the geological uncertainty is high.

Four new prospects sound impressive on an earnings call. Whether any of them ever become discoveries is a question only a drill bit can answer.

I write about exploration because the world still runs on oil and it still needs great minds to find it.

First published on LinkedIn by Ryan Christensen (https://www.linkedin.com/in/ryanchristensen814/), in August, 2026. Reprinted with permission.

Ryan Christensen is a deepwater exploration geoscientist.

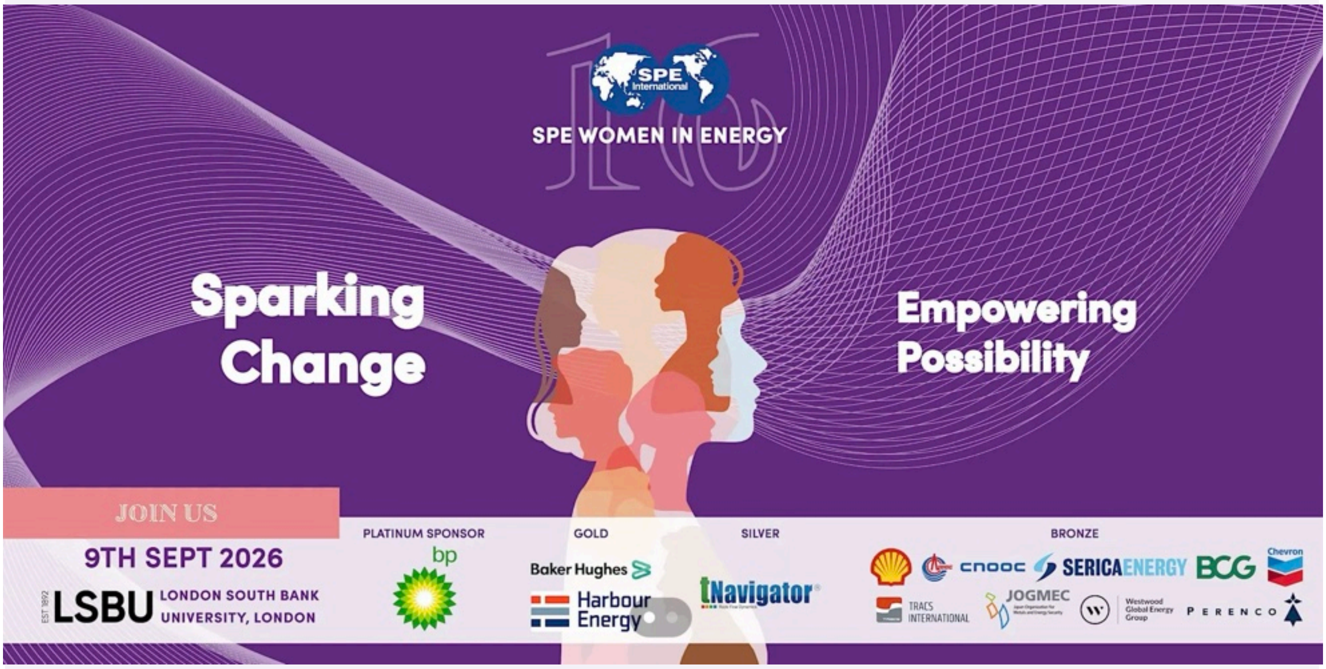
For the past 25 years, he's worked where geoscience meets strategy and leadership, helping high-performing teams discover over eight billion barrels of hydrocarbons in some of the most challenging environments on Earth. Opening the MSGBC Basin was one of those wins, and like all of them, it took a team, not one person. His exploration expertise includes West Africa, South America, and the Gulf of Mexico.

He shares insights on:
* Atlantic Margin & GOM exploration opportunities and play concepts
* What actually drives exploration success (and what doesn't)
* Energy markets & exploration strategy
* How to build a resilient career in a volatile industry
* How high performers in demanding industries stay physically and mentally elite


Ryan Christensen

He says: "I share what I've learned because our industry gets better when we learn from each other's wins and losses. If you're interested in Atlantic Margin exploration, deepwater play concepts, energy markets or performing at your best through a long and demanding career, you're in the right place."

SPE London Women in Energy 2026: Sparking change and empowering possibility



Place: At London South Bank University, London
Day: Wednesday 9 September
Time: 8 AM to 6 PM

TICKETS available via this link

The **London Women in Energy Seminar** returns on 9 September 2026 at London South Bank University, bringing together 150+ professionals to explore gender balance, leadership, and career development under this year's theme: 'Sparking Change and Empowering Possibility'.

Keynote speakers are **Lorna Blaisse (CEO, Helium One Global)** and **Kate Williams (SVP Subsurface and Reserves, Harbour Energy)**.

Fireside chat with **Lamé Verre, Director, Net Zero at the Crown Estate**.

This volunteer-run, not-for-profit event is only possible through sponsorship. We keep tickets low to ensure accessibility for early-career professionals and students, and we welcome a diverse audience from across the energy sector.

Talos Energy: What makes a good E&P CEO?

Talos Energy's move from founder Tim Duncan to former Shell executive Paul Goodfellow raises a wider question: what really prepares someone to lead a small or mid-cap E&P, where individual judgement on assets, capital and M&A can shape the whole company?

First published in **PetroEquity *Signal*** (https://petroequitysignal.com) by Oberon Houston, on 20 August 2026. Reprinted with permission.

Talos Energy is a useful test of a question that confronts many growing independent oil companies. The person who is exceptionally well suited to build a business is not always the obvious person to lead it once it becomes larger, more complex and more institutional.

Boards often respond by looking for a different kind of chief executive, frequently from Big Oil, where executives have managed organisations and capital programmes of far greater scale. That can be a sensible choice, but it comes with its own risks.

Talos has moved from its founder Tim Duncan, an entrepreneur whose career was built around creating independent oil companies, to Paul Goodfellow, who spent more than three decades at Shell. The contrast offers us a useful way to examine what each type of career prepares a CEO to do, what it may leave untested, and what can be gained or lost when a founder-built company chooses a more institutional leader.

When Tim Duncan founded Talos Energy, it was not his first rodeo. It was the third version of an independent oil company model that Duncan and many of the same people around him had been developing for more than a decade. By the time Talos was created in 2012, the group behind it had already built and sold two Gulf of Mexico businesses, worked together through several commodity cycles and developed a way of combining subsurface judgement, acquisitions, exploration and portfolio management. Talos was less a conventional start-up than the continuation of an entrepreneurial system built and honed by the same team.

Duncan trained as a petroleum engineer at Mississippi State and later completed an MBA at the University of Houston. His early career included reservoir engineering and evaluation roles at Pennzoil, Zilkha Energy and, my old stomping ground, Amerada Hess. Zilkha was a relatively small Gulf of Mexico company using improved seismic imaging and technical interpretation to find value that larger organisations had missed. Duncan has since spoken about being struck by how much value a small team could create. The people evaluating the subsurface were close to the key decisions on asset acquisitions, committing capital and realising value from the business.

Tim then joined Gryphon Exploration in 2000 as Manager of Reservoir Engineering and Evaluations. Gryphon was backed by private capital and pursued Gulf opportunities that required technical and commercial decisions to sit close together. An asset had to be understood geologically, valued financially and compared with the other places where a limited pool of capital could be deployed. Gryphon was acquired by Woodside in 2005, after which Duncan and several colleagues, like many successful PE-backed management teams, began again from scratch.

Phoenix Exploration was formed in 2006. Steve Heitzman, another Gryphon veteran, became President and CEO, while Duncan was a founder and Senior Vice President of Business Development. John Parker, who would later be part of Talos, led exploration. Duncan's role put him directly into asset evaluation, negotiations and transactions, giving him experience of the corporate side of an independent before he became a chief executive himself. Phoenix was sold in 2011 to a buyer group led by Apache. By then, Duncan had spent more than a decade close to the important decisions around subsurface, capital deployment and M&A that are the key building blocks in forming and growing a successful E&P company.

Apollo and Riverstone backed the formation of Talos Energy LLC the following year with commitments of up to $600 million. Duncan became President and CEO and was joined again by several executives from Gryphon and Phoenix. Members of the team had already worked together for more than a decade, and much of the capability sat in a group of people who had spent years assessing opportunities and making investment decisions together. Duncan was the founder and chief executive, but Talos was also the product of a management team with a long shared history.

The choice to stay offshore, and specifically in the Gulf of Mexico, was not an obvious one. It was made while North American capital was moving heavily towards shale. Horizontal drilling and hydraulic fracturing were transforming US oil and gas, attracting large amounts of equity and debt and changing the way investors thought about growth. Talos stayed with the Gulf, where Duncan and his colleagues understood the assets and where reduced competition could create opportunities. The company moved quickly, acquiring Helix's Energy Resource Technology business in 2013 and giving itself an operating platform rather than waiting for exploration success to establish a production base.

The model that developed mixed acquisition, exploitation of existing infrastructure, exploration and development. Existing production could fund activity elsewhere, mature facilities could support nearby discoveries, and acquired portfolios could contain opportunities that looked different once examined by another technical team. Talos was neither simply an explorer nor merely a consolidator of ageing offshore production. Its strategy depended on seeing assets simultaneously as subsurface opportunities, operating positions and pieces of a wider corporate portfolio.

Zama demonstrated the exploration side of that culture. Talos entered Mexico following the reopening of the country's upstream sector and, together with Premier Oil and Sierra Oil & Gas, discovered Zama in 2017. It was one of the most significant offshore discoveries of the period and gave Talos a profile far beyond its corporate size. The project later became complicated by unitisation and the role of Pemex, and Talos subsequently began monetising part of its exposure, but the original decision to enter Mexico showed a willingness to accept geological, commercial and country risk in pursuit of something capable of materially changing the company.

Duncan described the chief executive role around that time in terms that reflected the environment in which he had spent his career. He needed to understand Talos's capital structure and liquidity, make the final call on major capital-allocation decisions and attract the people required to create shareholder value. In an independent company, those responsibilities are tightly connected. An exploration programme, an acquisition and the balance sheet all compete for the same pool of capital, and getting one of those decisions wrong can not only damage returns but materially impede the company's ability to keep growing.

Talos became a public company in 2018 through its combination with Stone Energy. Duncan had spent much of his career answering to concentrated private-equity owners, some of whom were already familiar with the management team from earlier ventures. He was now running a listed company whose shares could be compared every day with other E&Ps, with the oil price and with any number of alternative investments. The company continued to expand rather than shifting primarily towards a cash-return model.

The acquisition programme remained central. Talos agreed to acquire EnVen Energy in 2022 for $1.1 billion, adding oil-weighted deepwater production and increasing its operated infrastructure. In January 2024 it agreed to acquire QuarterNorth Energy for $1.29 billion, adding further production, reserves and operating positions. Talos had also developed a carbon capture and storage business along the US Gulf Coast before selling it to TotalEnergies in 2024. By then, Talos had become a much larger and more complex company than the business formed in 2012, while remaining firmly centred on the Gulf of Mexico. It was now a meaningful publicly listed E&P, with greater operating scale and a wider set of capital-allocation demands from both the business and its shareholders.

The market did not always reward that growth in the way the expansion of the company might suggest. Talos came public into an environment in which shale commanded much of investor attention, then lived through weak oil prices, the 2020 collapse and a wider change in E&P investor expectations away from production growth and towards free cash flow, debt reduction and distributions. Long-cycle offshore investment was also distinctly out of favour. Investors had become accustomed to the short development times, visible drilling inventories and apparent capital flexibility of shale, while offshore projects were often viewed as slower, more capital intensive and less responsive to the commodity cycle.

That preference became fashionable across the sector, although it was not necessarily economically correct. Short-cycle shale brought its own problems of rapid decline, repeated reinvestment and finite high-quality inventory, while offshore assets could offer long-lived production, infrastructure value and lower decline once developed. Those characteristics have since returned to favour as the industry has paid more attention to resource duration and the limitations of continuously replacing rapidly declining shale production. Deepwater has again become an important source of growth for major and independent producers. Talos spent much of Duncan's tenure building a business around assets whose characteristics were not always those the market wanted to reward at the time, but which look rather less unfashionable today.

That backdrop makes Talos's share-price record harder to interpret in isolation. A company can issue equity, buy assets and build a larger portfolio while its market valuation remains constrained by sector sentiment, commodity prices or a lack of enthusiasm for the type of growth being pursued. Duncan's record is better judged alongside the business Talos became under his leadership and the subsequent return of industry interest in deepwater. Talos grew materially, acquired substantial offshore infrastructure and retained a willingness to pursue exploration opportunities capable of changing the scale of the company.

Growth also changes the job of the person running it. The founder of a relatively small business can know most of the senior team personally, participate directly in the largest investments and remain close to individual assets. As the organisation expands, more decisions have to be made without the founder in the room. Authority moves further down the company, information has to move reliably back up, and processes that once seemed unnecessary begin to determine whether the organisation can reproduce good decisions across a larger portfolio.

Founders often build companies by moving quickly, concentrating responsibility and accepting a level of uncertainty that larger organisations would prefer to reduce before acting. The same company may later need more delegation, more formal planning and more repeatable ways of assessing capital. The ownership model can change the demands as well. A PE-backed company is typically working with a small number of highly engaged owners who know the management team and understand the investment thesis in detail. A public company has a broader shareholder base, continuous market scrutiny and investors who may have very different views on growth, leverage and the use of capital. Those changes can be difficult because they alter some of the mechanisms through which the business originally succeeded. There is no public evidence that Duncan resisted that evolution. The issue arises because companies can grow beyond the scale, and beyond the ownership structure, in which one person's judgement can remain embedded in every important decision.

Formal structures can improve a larger organisation. Investment criteria become clearer, operating systems more consistent and responsibility easier to delegate without losing visibility. Offshore oil and gas makes some of those benefits particularly valuable because individual wells can involve large capital commitments, infrastructure carries long-term abandonment liabilities and operating failures can have consequences far beyond a missed quarterly target. A company that has grown through the judgement and relationships of a relatively small group eventually needs to ensure that the organisation itself can keep making good decisions as responsibility spreads more widely.

The same process can remove something valuable. Independent oil companies often exist because they can make decisions that larger companies find difficult. A mature field that barely moves the needle for Shell or BP can be highly material to a smaller operator. A discovery that is too small to justify attention in a supermajor portfolio may offer excellent economics if tied back to existing infrastructure. An independent can tolerate concentration that would be uncomfortable for a major and may be able to act on an acquisition or farm-in before a longer corporate approval process has run its course. Larger organisations also tend to rely less on individual talent and concentrated decision-making. They are designed to produce consistent outcomes through systems, committees and repeatable processes rather than through the judgement of a small number of people. That can make them more resilient, but it can also reduce the influence of individuals with distinctive judgement or expertise whose views might otherwise have a material positive influence on the company's direction.

That balance becomes harder as the independent gets bigger. Too little structure leaves the company dependent on individuals and makes consistent decision-making harder. Too much structure can turn an entrepreneurial organisation into a smaller imitation of the companies from which it once bought overlooked assets. A larger independent has to become less dependent on its founder without losing the ability to make the kinds of decisions that made the company worth building. That is not easy.

Talos had plainly become a bigger and more complex company by 2024. Duncan left in August of that year. Talos has not publicly explained the underlying reasons for the leadership change, and there is no basis for reconstructing them from the outside. Larger founder-led companies often reach points at which boards consider whether a different type of chief executive might suit the next stage of development. That general pattern tells us nothing definitive about what happened inside Talos. The choice the board eventually made, after a search lasting roughly six months, does allow a different question to be asked.

Tim's replacement, Paul Goodfellow, spent more than 34 years at Shell, much of it in wells, with some broader assignments in regional and business leadership, including Shell's global deepwater business. He therefore arrived at Talos with deep technical understanding of wells and substantial experience of working inside a major oil company, but with a career that had been formed very differently from Duncan's.

That matters more at a company the size of Talos than it would at Shell. A supermajor is deliberately built so that the institution is stronger than any individual executive. Strategy, treasury, M&A, portfolio management, investor relations, technical assurance, legal, risk and government affairs all exist around the operating businesses, supported by deep benches of specialists and multiple layers of challenge. A senior executive can be extremely influential, but the organisation is designed to keep functioning if that person leaves. At a small or mid-cap E&P, the chief executive can be one of the most important capabilities the company possesses. A handful of decisions on assets, exploration, acquisitions and capital can alter its direction for years.

The difference is partly one of concentration. Shell can make a poor investment and absorb it within an enormous global portfolio. A comparable mistake at Talos can constrain the balance sheet, prevent the next acquisition, force an asset sale or reduce the capital available for exploration. The reverse is also true. A single well, discovery or transaction can materially increase the value of a smaller company. The quality of individual judgement therefore has far more leverage on the outcome. Investors in a mid-cap E&P are buying the assets, but they are also buying the judgement of the people deciding what those assets should become.

An E&P company is also not simply a collection of wells that are drilled. Wells are one important part of a much wider system that includes geology, geophysics, reservoir engineering, exploration strategy, development planning, production operations, infrastructure, commercial agreements, portfolio management, financing, M&A and capital allocation. A senior wells executive can have exceptional expertise in an area on which billions of dollars depend without having spent the same amount of time making the broader corporate choices that determine which assets the company should own, what it should pay for them and how aggressively it should grow.

That is not an argument that Goodfellow was the wrong appointment. A growing E&P may have very good reasons to recruit someone from a major. Talos had become a much larger deepwater business with more assets, more wells, more infrastructure and greater operational complexity than the company Duncan originally founded. Goodfellow's experience of Shell's technical standards, wells organisation and global deepwater portfolio may prove highly valuable as Talos operates at that scale. His knowledge of Shell's offshore asset base, the way a supermajor allocates capital and the people across the industry may also be useful in identifying and acquiring assets, particularly where those assets are being sold by Shell or other majors. The open question is whether those capabilities translate into the broader corporate judgement required of the CEO of a listed independent.

The scale of a role inside Big Oil can make that question surprisingly easy to overlook. Someone may have managed a drilling organisation many times larger than an entire independent E&P company, controlled huge budgets and worked across some of the most technically demanding assets in the world. The numbers are impressive, but they do not necessarily tell shareholders how much of that person's career involved deciding which basin the company should enter, whether an acquisition offered better value than exploration, how much leverage the balance sheet could safely support, when an asset should be sold or whether the company's own shares were the best investment available.

Those decisions matter more as the company gets smaller because there is less institution around the CEO to compensate for gaps in experience. A major can surround an executive with specialists who have spent entire careers in corporate finance, M&A, portfolio management or capital markets. A mid-cap E&P has fewer layers and fewer places for responsibility to diffuse. The CEO may be the person who first identifies an acquisition, challenges the geological case, decides whether the price is acceptable, chooses how far the balance sheet can stretch and then explains the decision directly to shareholders. Weakness in one of those areas can flow much more quickly into the value of the company.

Oil and gas investors can sometimes give technical credentials more weight than they deserve when assessing chief executives. Drilling is tangible, highly visible and easy to associate with the physical business, but in established basins the industry already knows how to drill the well. Contractors, service companies and experienced technical teams provide mature capabilities, and execution can be measured and improved. Much of the value has already been determined before the rig arrives: which acreage the company chose to own, what it paid for it, whether exploration offered a better return than acquisition, how the opportunity was financed and what other uses of capital were rejected to pursue it. Those are much closer to the decisions on which a public E&P CEO ultimately succeeds or fails.

The geology can be excellent and the well can be drilled perfectly while shareholders still receive a poor outcome if the company paid too much for the acreage, funded it badly or chose the opportunity over something better. A technically marginal asset can sometimes create substantial value if it is acquired cheaply and existing infrastructure changes the economics. The CEO therefore needs enough technical understanding to challenge the specialists, but the job is not to be the best driller, geologist or reservoir engineer in the company. It is to decide which technical opportunities deserve shareholders' capital and which do not.

Duncan's career had put him unusually close to those choices. At Gryphon, Phoenix and then Talos, subsurface judgement, capital deployment and M&A were among the principal building blocks of the businesses themselves. The organisations were small enough that these decisions could not be separated into distant corporate functions. His business-development role at Phoenix had placed him directly into evaluations and transactions before he became a chief executive, and Talos then required him to make the same kinds of choices with an increasingly large balance sheet.

Goodfellow's Shell career was built inside a very different system. Shell could surround a senior technical or business leader with treasury, corporate development, central strategy, investor relations, specialist commercial teams and a group-level capital-allocation process. A wells leader could therefore become very senior while remaining primarily a wells specialist. Broader management assignments increase the range of experience, but they do not recreate the environment in which the chief executive personally carries responsibility for the major choices affecting the value and future of the whole company.

That institutional strength is one of the reasons majors can tolerate changes in individual leadership better than smaller E&Ps. Shell does not cease to understand LNG, deepwater or trading because one executive leaves. The processes, data, technical capability and organisational memory remain. A mid-cap company can be much more exposed to individual judgement. A CEO with unusual skill in recognising acquisitions, understanding the subsurface or judging the right moment to take risk can have a disproportionate positive influence on the company. Replacing that person changes more than the name on the organisation chart.

The same concentration creates risk. A founder-led company can become too dependent on the founder, particularly as it grows and more decisions need to be delegated. The argument is not that concentrated judgement is always preferable. Talos had become large enough that greater structure and repeatability were increasingly valuable. It is simply that the transition cannot be assessed by assuming a larger corporate background automatically represents an upgrade in CEO capability. The executive from the major may bring systems and technical depth while still having to learn parts of the job that the founder had been practising for years.

Public ownership magnifies the difference. The CEO of a listed independent has to decide not only where to spend capital but whether the company should spend it at all. An attractive acquisition may still be inferior to repurchasing the company's own shares. Exploration may offer substantial upside but compete with debt reduction. Growth may justify issuing equity at one valuation and erode much of the benefit at another. An asset may be strategically attractive but simply too expensive. These choices sit above the technical merits of the individual opportunity and can determine whether corporate growth becomes shareholder value.

M&A brings the issue into particularly sharp focus. An executive can spend years assessing acquisitions inside a major without having been the person who first decided that a particular strategic move should exist. Smaller-company CEOs often have to originate as well as approve. They need to recognise an opportunity before a formal process develops around it, understand why the seller sees the asset differently, judge how much of the balance sheet should be committed and know when to walk away despite the work already invested. One good acquisition can transform a smaller E&P; one bad one can remove years of financial flexibility.

Goodfellow may have an advantage here that is easy to miss if his background is considered only in terms of wells. Three decades at Shell give him extensive knowledge of the offshore industry, of how a supermajor assesses and ranks assets, and of many of the people who manage those portfolios. A former head of Shell's global deepwater business may understand particularly well why an asset that struggles to compete for capital inside a supermajor can have much greater value in a smaller company. That knowledge could prove useful to Talos as the majors continue to reshape their portfolios.

History offers enough examples to make shareholders cautious about assuming that seniority inside Big Oil is sufficient preparation. John Manzoni spent 24 years at BP, reached its board and ran Refining & Marketing before becoming chief executive of Talisman Energy. He followed Jim Buckee, under whom Talisman had been built through a much more entrepreneurial international model. Manzoni's tenure ended in 2012 and his successor, Hal Kvisle, subsequently placed greater emphasis on living within the company's means, focusing capital and improving operations. Talisman's problems cannot sensibly be attributed to Manzoni's BP background, but the scale of his previous responsibilities did not make success at an independent automatic.

Chris Finlayson spent more than 30 years at Shell before joining BG Group and later becoming chief executive. His tenure at the top was short and difficult, although he inherited genuine operating and project problems. Andy Inglis spent 30 years at BP and ultimately ran its exploration and production business before later becoming chairman and CEO of Kosmos Energy. Kosmos has developed significant resources under Inglis while also facing difficult questions around leverage and shareholder returns. These are complicated records rather than evidence for a rule, but they show why the size of a previous corporate title should not end the examination of a CEO candidate.

There are also strong counterexamples. Peter Coleman spent 27 years at ExxonMobil before leading Woodside for a decade. Lee Tillman moved from ExxonMobil to Marathon Oil and ultimately led the company through substantial portfolio change and its sale to ConocoPhillips. Roy Franklin moved from BP into smaller independent-company environments including Clyde Petroleum and Paladin Resources. Executives can clearly move successfully from Big Oil into smaller public companies. What matters is how broad their experience became and how effectively they adapted once the institution around them could no longer carry so much of the corporate decision-making burden.

Goodfellow's early decisions at Talos are encouraging in that respect. His 2025 strategic reset was not centred on wells or operational metrics alone. It introduced clearer objectives around cash-flow improvement, leverage and shareholder distributions while retaining organic investment, selective acquisitions and longer-term offshore growth. Talos has reduced leverage and repurchased shares while continuing to invest in its portfolio. Those are whole-company decisions and provide more useful evidence of his development as a public E&P CEO than his previous technical titles.

He also inherited a strong platform from Duncan. Talos already had meaningful Gulf production, operated infrastructure, exploration capability and the additional scale created through EnVen and QuarterNorth. Deepwater itself had moved back towards the centre of industry attention after years in which investors strongly preferred short-cycle shale. Goodfellow did not arrive to rescue a failed E&P or repair a broken asset base. He arrived to lead the next phase of a company that Duncan and his colleagues had already built to meaningful scale.

The recent agreement to acquire deepwater Gulf assets from Shell is particularly interesting. A former head of Shell's global deepwater business now leads an independent acquiring assets from the company where he spent most of his career. There is no public evidence that Goodfellow personally originated the transaction, but his relationships within Shell, familiarity with its Gulf portfolio and understanding of how a supermajor ranks competing investments may have been useful in identifying the opportunity and getting Talos into a position to pursue it.

Talos does not need to operate those assets as Shell did. Mature infrastructure, smaller developments, field-life extension and nearby exploration can be much more important to a mid-cap independent than to a supermajor comparing them with opportunities across a global portfolio. Goodfellow may therefore bring an advantage on both sides of the transaction: understanding why Shell is prepared to sell an asset and why the same asset might be worth more inside Talos.

Talos has continued to take exploration and development risk as well. Its activity in Mexico, its new operated exploration position offshore Honduras and its Gulf appraisal and drilling plans suggest that the clearer financial framework has not turned the company into a business concerned only with harvesting existing production and returning cash. Goodfellow has so far combined some of the financial characteristics public investors increasingly demand with the exploration and portfolio activity that formed part of Talos's original identity.

The decisions that will tell us most about him probably still lie ahead. Strong cash generation can allow a company to fund exploration, reduce leverage, repurchase shares and consider acquisitions at the same time. The CEO's capability becomes more visible when those choices compete directly. Talos will eventually face moments when an acquisition looks attractive but its own equity is cheap, when exploration upside competes with debt reduction, or when a strategic opportunity requires more capital than shareholders want the company to spend.

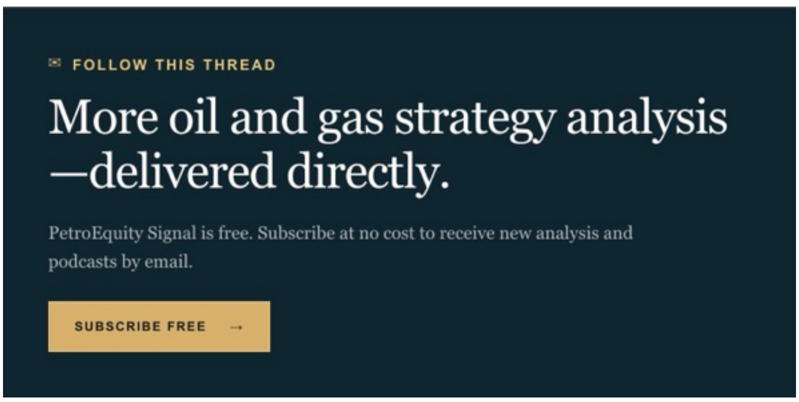
At a major, the consequences of a single decision can be diluted across a vast portfolio and an institutional decision-making system. At Talos, one of those decisions can alter leverage, ownership, resource life and the company's ability to pursue the opportunity that comes next. That is why the quality and breadth of the CEO matter so much more at a company of this size. There are fewer layers between the judgement of the individual and the financial outcome experienced by the shareholder.

Goodfellow may prove very good at making those choices. His early Talos record gives some evidence that he is broadening beyond the technical discipline in which much of his career was formed, and his Shell knowledge may create commercial advantages that are difficult to replicate. It remains reasonable for shareholders to recognise that some of the most consequential parts of the independent-company CEO job were less directly tested by his previous career than his expertise in wells and deepwater.

Talos therefore provides a more interesting succession than the familiar story of a founder handing over to a professional manager. Duncan had spent much of his career around the decisions that form and grow independent E&Ps: subsurface, capital deployment and M&A. Goodfellow had developed deep expertise in wells and later broader management experience inside Shell. Talos became large enough that its board chose that very different background for the next phase.

The company does not need Goodfellow to be the best wells engineer in the room. It needs him to be the best person to decide which risks Talos should own, where its scarce capital should go and which opportunities should be rejected so that better ones can be pursued. His technical background may help him make those decisions, his Shell relationships may expose him to opportunities and his experience of a major may bring useful discipline. None of those things substitutes for the judgement required to run the whole company.

That is ultimately what Talos will test. In a supermajor, the institution is designed to be stronger than the individual. In a small or mid-cap E&P, the chief executive can be one of the most important assets the company has. Duncan built Talos through a career spent close to the decisions that determine what an E&P should own and where it should deploy capital. Goodfellow now has to show that the expertise and experience accumulated inside Shell can be converted into that broader form of judgement when the consequences of the decision sit almost entirely inside the company he leads.



SPE London Energy Cup, September 2026

Improved PWC methodology applied to a plugging and abandonment job in offshore UK

Increased plugging and abandonment (P&A) activities demand efficient and cost-effective solutions to safely install cross-sectional cement barriers. We present a case study of a perforate, wash, and cement (PWC) job recently performed in a P&A operation in the UK. The improved PWC tool combines the advantages of the jet-based tool washing effectiveness with the cup-based tool bulk cement displacement, achieving better annular filling for larger casing sizes. Before the PWC job, the tubing had been cut and retrieved and the lack of good cement behind the 13-3/8" casing had been confirmed by logging.

Therefore, innovative approaches were undertaken to install and qualify this plug, such as conventional ballistics perforating being replaced by mechanical perforations due to casing integrity issues at the surface, and the larger casing size requiring improved cement displacement. During the engineering design phase, computational fluid dynamics (CFD) modeling and simulation were carried out, confirming the washing and cementing effectiveness. The operation was executed as planned.

The first trip was done with the mechanical perforator only intending to perforate the desired interval. After this was completed, the perforating tool was retrieved and the hybrid jet- and cup-based tool was run-in-hole, successfully tagging a previously installed bridge plug. From this point, the job was executed without any major issues. At the operator's request, a dummy pump, pull, and rotate sequence was performed before the cementing step to ensure that the operational parameters previously validated by the CFD could be achieved by all associated downhole and topside equipment. After waiting on cement had been concluded, the PWC plug was verified by tagging and pressure testing. Final verification of the job was carried out following a qualification matrix approach based on the extensive track record of the jet-based tool, correct execution of the job, successful previous jobs performed in 13-3/8" casing, and the favorable CFD output, thus eliminating the necessity of drilling out and logging. The challenges regarding the plugging and abandonment of this well required a unique combination of solutions in the form of a hybrid jet- and cup-based PWC tool and the usage of mechanical perforations due to other well integrity concerns.

Considering the success of this job, we conclude that its aspects helped extend the operational window of PWC tools to deliver safe solutions in similar wells.

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Introduction

Wells are to be plugged when they reach the end of their life cycle, which could be caused, e.g., by a lack of commercial viability or integrity issues; such a procedure must be carried out safely and provide a lasting solution, considering a long-term perspective (Khalifeh & Saasen, 2020). In this context, decommissioning is expected to become a large part of the industry efforts in the upcoming decades, with significant costs attached to this activity of plugging and abandonment (P&A) of wells (Chukwuemeka et al., 2023; Vrålstad et al., 2019).

A fundamental step during well P&A is restoring the original isolation yielded by the caprock, which is currently achieved mainly by installing cross-sectional cement barriers. Traditional methods for this purpose include section milling and cement squeeze, which are still largely employed today. However, perforate, wash, and cement (PWC) has appeared early 2010s as an alternative to these, evolving over the last 15 years since its inception (Delabroy et al., 2017; Ferg et al., 2011; Hovda et al., 2020; Leeson & Larsen, 2020; Pollard, 2021), effectively reducing operational times and cost while improving cement placing efficiency.

A comparison between section milling, cement squeeze, and the two existing PWC techniques (cup- and jet-based) can be seen in Jaculli et al. (2025a). **Figure 1** illustrates the main phases of a jet-based PWC operation.

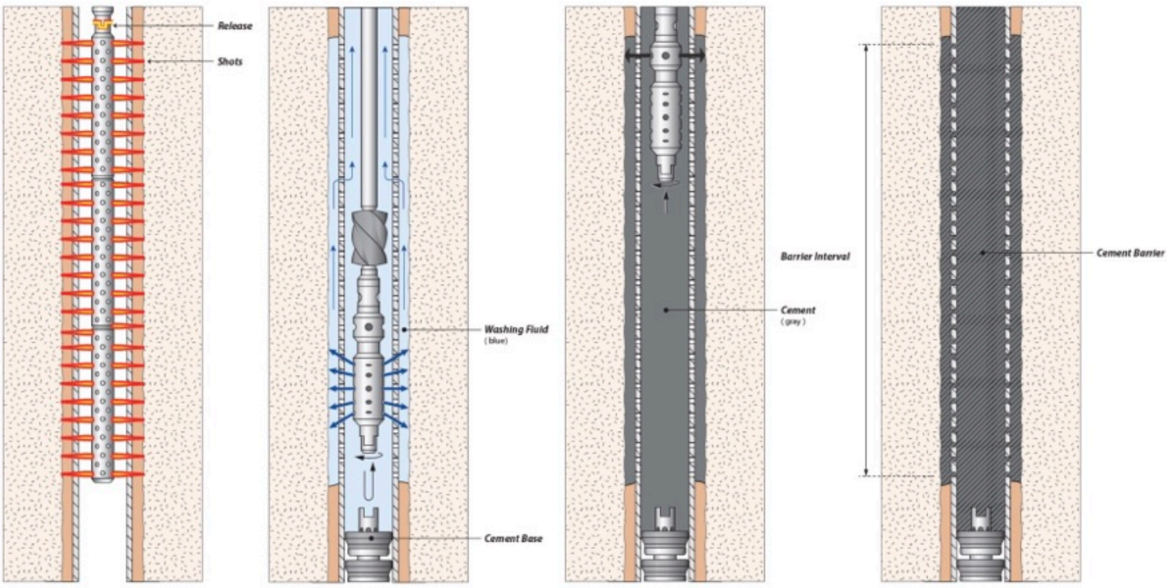

Figure 1—Main phases of the jet-based PWC operation (Jaculli et al., 2025a).

PWC as a method has been included as its own dedicated element acceptance criteria (EAC) table in NORSOK D-010 (2021), which qualifies it as an established operation to install a well barrier element (WBE) in the well and thus restore isolation. It has also been recognized as "field proven" by Offshore Norge, a major organization for the oil industry in the Norwegian Continental Shelf, in their P&A roadmap1, confirming its status as a mature method for annular remediation. Nevertheless, as new challenges arise, the technique must evolve continuously to cover wider operational windows while improving installations and barrier verification.

PWC has been successfully deployed not only in the Norwegian and UK portions of the North Sea (Delabroy et al., 2018; Govil et al., 2024; Hovda et al., 2024; Joneja et al., 2018; Lucas et al., 2018; Thomson, 2018; Torvestad et al., 2022), but also in several regions across the globe e.g. Southeast Asia (Azihar et al., 2022; Ho, 2018; Kueh et al., 2018; Mokhtar et al., 2019; Othman et al., 2018; Razak et al., 2021; Teo et al., 2018, 2020; Yang et al., 2019; Yusof et al., 2018; Zulkipli & Saw, 2019; Zulkipli et al., 2018), Middle East (Al Adawi et al., 2024; Ansari et al., 2017; Ansari et al., 2016b, 2016a; Hurtado et al., 2024), West Africa (Allapitchai et al., 2021, 2023), the Netherlands (Dahmani et al., 2022; Mohamad & Joppe, 2022), Australia (Bothamley et al., 2020; Jaculli et al., 2025b), the Gulf of Mexico (Kehlenbeck II & McNicol, 2023), and Brazil (Moreira et al., 2025). Applications include remediating poor annulus cement, providing zonal isolation, fixing sustained annulus pressures, slot recovery, and, of course, installing cross-sectional cement barriers for permanent P&A. Therefore, it has already been established that this method offers advantages over conventional section milling and cement squeeze operations.

In this paper, we discuss an operation carried out in the UK using a hybrid jet- and cup-based PWC tool, which combines the advantages of both tools to improve cementing of larger casing sizes. Larger casings have increased B-annulus volumes, requiring more cement to achieve the same plug length, and thus the addition of a top cup above the jetting head helps with cement displacement by blocking flow inside the casing and forcing it more easily into the annulus. The job was engineered by the operations team in combination with CFD to validate the washing and cementing operational parameters. The job was successful, producing a competent cross-sectional cement barrier at the target depth interval. Challenges related to tagging contaminated cement are discussed.

Background

The well was drilled originally in 1989, and later sidetracked, in an offshore field located in the UK portion of the North Sea. **Figure 2** illustrates its upper portion, highlighting the selected PWC interval. Well integrity issues were identified with communication between the tubing and A-annulus, and through the B-C-D annuli caused by holes in the 13–3/8" and 18–5/8" casings, leading to a shallow leak. Its P&A program had started prior to the PWC, with the tubing and the 9–5/8" production casing having been cut and recovered. A pre-job log identified that there was not enough cement in the annulus to comply with a barrier below the minimum safe abandonment depth (MSAD) of 5223 ft MD, thus remedial work was necessary. A candidate interval without cement/with poor cement was identified, where a cross-sectional cement barrier could then be installed. In anticipation, a bridge plug was set below the target interval, and the well was suspended. The next step would be to install the cement barrier, and hence PWC was selected as the remediation method.

Given the larger casing size than a 9–5/8" production casing —where the majority of PWC is performed — an option was made to use a hybrid jet- and cup-based PWC tool to improve cement placement in the annulus.

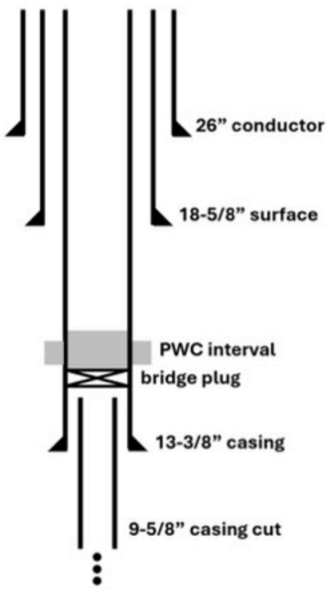

Figure 2—Simplified well schematic of the production casing and above, highlighting the selected PWC interval.

Compliance with P&A regulations in the UK is overseen by the North Sea Transition Authority, with guidelines published by Offshore Energies UK (OEUK, 2022). Requirements are of two cement barriers of 100 ft MD each, or a 200 ft MD combination barrier, placed atop every bearing zone with flow potential.

These lengths include both the annulus and inside the casing, which should overlap. Discrete sections of good annular cement may be stacked, but the inner cement must overlap the whole interval. Any deviations must be assessed through ALARP. Verification of newly installed cement barriers is achieved by a combination of volume calculations, correct operational procedure, tagging, pressure testing, logging, and/ or track record, as seen fit, with no explicit mandate over any method (especially logging). This contrasts with the NORSOK D-010 (2021) approach, which requires that a track record be built first — for similar wells in similar conditions — before the operator can be exempted from logging.

Methodology

Equipment involved

The tool selected for this operation is a combination of the jet- and cup-based PWC tools, hence the name hybrid PWC. This design represents a step-change versus conventional jet-based systems by fundamentally improving control of cement placement and annular fill efficiency. It utilizes the main advantages of the jet-based tool (previously addressed in Jaculli et al., 2025a), which are then complemented by the cup-based tool for improved annulus flow (activated only during the cementing phase). By combining high-energy jet washing with a cup-based pressure-relief mechanism during cementing, the system ensures a higher proportion of the pumped cement is forced into the annulus, even in large or irregular annular geometries.

This results in reduced sensitivity to fluid density and rheological hierarchy and optimizes barrier placement in more challenging conditions where cement volume optimization is critical. **Figure 3** illustrates a typical hybrid PWC bottomhole assembly for a one-trip operation with perforating guns. However, as addressed earlier, a mechanical perforator was selected instead to perform the job reported in this paper, resulting in a two-trip system. An internal cement foundation (ICF) is used to serve as a base for cement in the A-annulus.

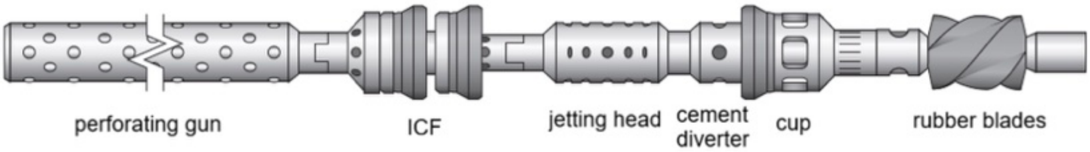

Figure 3—Hybrid PWC BHA and its main components, from left to right: tubing-conveyed gun, internal cement foundation (ICF), jetting head, cement diverter, cup, and rubber blades.

The jetting head is used to wash and clean out movable debris, e.g., barite, formation, cement traces, etc., in the annulus behind the perforated casing. It features jet nozzles positioned at various angles, engineered for optimum configuration and jet exit velocity. This prepares the A- and B-annuli for the plugging material (cement), which is placed using the cement diverter. In addition, a cup is positioned atop the cement diverter to ensure that the cement bulk displacement is redirected into the B-annulus while blocking the A-annulus. This combined effect is seen in **Figure 4**. A bypass valve in the cup allows fluid flow to bypass it when necessary (e.g. during washing or circulating out of the hole), as illustrated in **Figure 5** (overleaf). The jetting head and cement diverter are ball-activated, allowing the tool to switch modes between washing and cementing.

Finally, the rubber blades create flow disturbances when rotated, which aid the displacement process for the

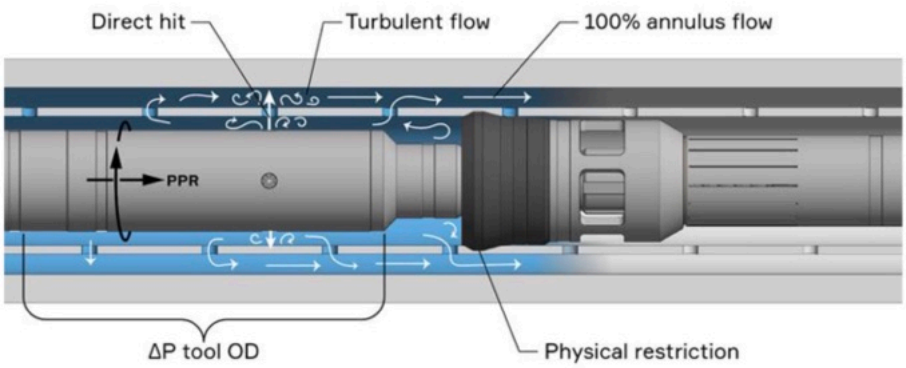

Figure 4—Combined effect of fluid jetting and bulk displacement during the cementing pump, pull, and rotate (PPR) phase. Cement exits through the cement diverter as jets that hit the wellbore and then flows upwards in the B-annulus as the A-annulus is blocked.

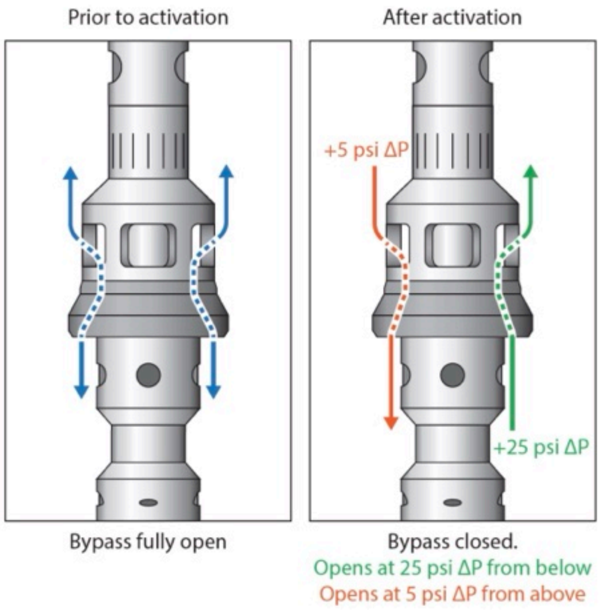

Figure 5—Bypass valve mechanism in the top cup, allowing fluid flow to bypass it when necessary (prior to activation), while blocking the A-annulus during cementing (after activation).

cementing operation further.

CFD Design

The CFD methodology applied for this case has been developed over the past years and captures the fluid dynamics behind the washing, spacer, and cementing phases, with adequate well geometry, tool movement, and fluid properties. It is outside the scope of this paper to discuss the CFD model in length; such a discussion is left to a future publication. Instead, we present some assumptions of the model setup, discuss the data collection process, and illustrate which results we can achieve. The goal of the CFD model is to confirm the system's capability of washing the annulus clean and placing cement adequately throughout the whole circumference and length of the interval. When an aspect of the operation diverges from this standard, a CFD is recommended to confirm the parameters. Adequate operational parameters are selected to achieve this goal, and thus, a successful CFD model confirms that these parameters are applicable to the real operation. The final job design considers the CFD results and the accumulated experience from the tool track record, through cooperation between the technology and operation teams.

The process starts with data collection to feed the model, which is discussed with the operator. Most of the data is fixed for the well and cannot be changed, such as casing size, open hole size, and inclination. Typically, fluid rheologies are also pre-determined based on what the operator intends to use. Then, the operational parameters (tool rotational speed, tool trip speed, and flow rates) remain; these are provided by the operations personnel, who design the job based on standard parameters that have been established internally for various casing sizes and were further validated in the field through several successful plug installations, while accounting for the special job aspects that required a CFD in the first place.

Figure 6 (overleaf) illustrates the CFD model setup. This horizontal setup is only for better visualization; the model considers the actual inclination of the well. For conservativeness, the inclination was selected as 7 degrees at the target interval, but the survey indicates a maximum of 3 degrees. The left side represents the rathole below the bottom perforation, while the right side represents the top perforation. This well had a 13-3/8" casing inside an 18" open hole, requiring a hybrid PWC tool with an outer diameter (OD) of 12".

Since CFD is typically a very resource-intensive simulation, we reduce the domain to 7-10 meters of the real PWC interval, which, by experience, is sufficient to deliver converging results about the tool performance in that scenario, thus being representative of the whole PWC interval. A washing-spacer-cementing simulation package may take around 10 to 15 days of computational time to complete, depending on the model size, total simulation time, and tool speed across the simulation domain. It is possible to stop

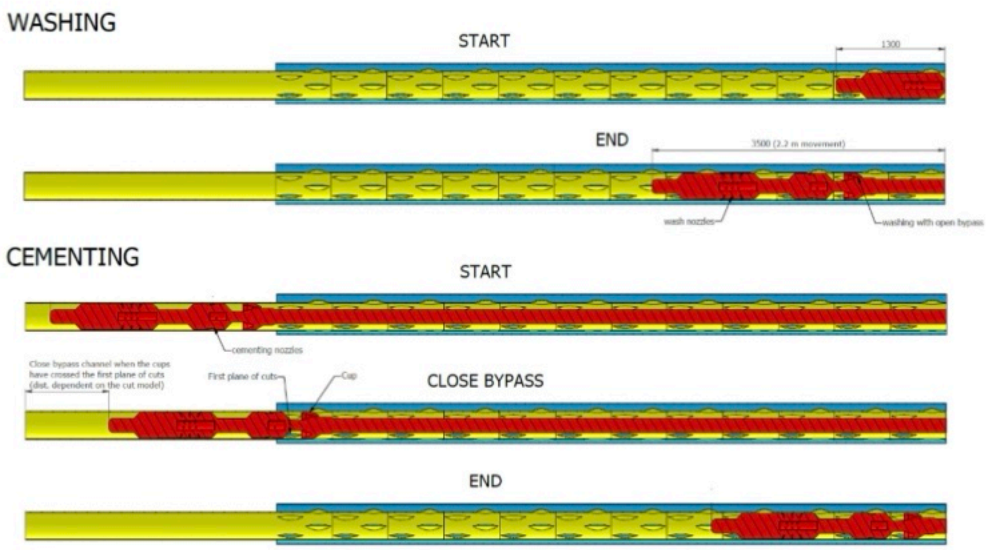

Figure 6—CFD model setup for the washing and cementing phases, showing the tool start and end positions for each one.

them earlier and save time if a good result is already foreseen from the first meters.
Each phase (washing, spacer, and cementing) is carried out separately, and the start condition of the next step may be based on the end condition of the previous. The washing pass is typically carried out with a downward tool movement, and as such, the tool moves from right to left. Meanwhile, the cementing pass is carried through a pump, pull, and rotate (PPR) sequence, hence the tool moves from left to right. Since the hybrid tool has the bypass valve, it must be closed in the cementing simulation when the tool nozzles enter the perforated interval, as indicated in the close bypass step. This works essentially as a wall being added to restrict fluid flow in that portion of the simulation domain. Therefore, based on the desired travel distance of the tool and the tool speed, a simulation time is calculated and input. As the tool travels, it alters the boundary between the solid and the fluid domain, thus remeshing occurs to adjust for that.

An important aspect of this job is that the perforations were to be created in the well by a mechanical perforator. Therefore, the CFD model had to capture the shape of this perforation, which differs from the usual holes made by perforating guns. The mechanical perforator tool performs 4 cuts per activation, spaced 90 degrees around the tool circumference, and the activations were spaced by 33 cm (i.e., 3 activations per meter, or roughly 1 activation per foot). PWC jobs are typically performed with 3 activations per meter, depending on requirements for annulus access, but also operational time constraints. **Figure 7** illustrates the

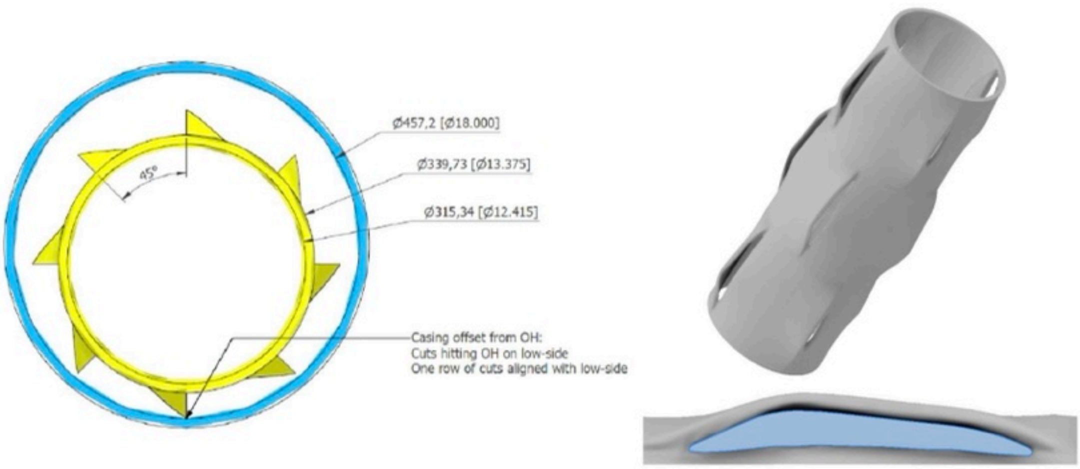

Figure 7—Model for the mechanical perforations. On the left side, a cross-sectional view of the perforated casing inside the wellbore; on the right side, a perspective view of the perforated casing, with the shape of the perforations highlighted below.

mechanical perforations and the perforated casing. The shape of the perforations is provided by the tool vendor according to data from 3D, which gives the total flow area (TFA) yielded by each perforation. The final shape and TFA are dependent on the perforator tool diameter and casing properties, such as diameter, weight, and grade.

Finally, adequate fluid modeling is fundamental for the model to be representative. The interaction between the in-situ fluid and the pumped fluid must be understood to ensure that the pumped fluid can displace the in-situ fluid correctly; the fluids are thus modeled as miscible, but in a laminar flow regime for simplicity, as the non-Newtonian fluid models are not strictly developed for turbulent flow. The setups for the washing and cementing simulations thus change based on the chosen fluids to represent the in-situ and pumped fluids. The main parameters needed are densities, rheologies, and, if non-Newtonian, which model captures it best. Densities are selected in such a way that the cementing phase is as favorable as possible due to the density hierarchy between a lighter wash fluid and a denser cement.

In the washing simulation, the in-situ fluid is typically modeled as settled barite as a worst-case scenario, since it is difficult to ascertain the fluid condition in the annulus. The majority of the wells being abandoned have been drilled decades ago, which is enough time for particles mixed in the drilling fluid to settle over time, since that fluid volume has been trapped in the annulus for all this time. The settled barite is modeled as a Bingham plastic fluid with a high yield point, which approximates its near-solid behavior while retaining its flowability once circulation is established. Data for the barite fluid model parameters have been taken from the literature (Vrålstad et al., 2018) and tested in CFD and in-house. Meanwhile, the pumped fluid is either seawater (Newtonian) or a water-based mud (WBM, non-Newtonian), depending on other requirements from the operator.

In the cementing simulation, the in-situ fluid is the same fluid that was pumped during the washing phase (i.e., seawater or WBM), and the pumped fluid is cement (non-Newtonian). Although this does not apply to the job reported here in this paper, a spacer may be pumped between the wash fluid and the cement in case they are incompatible; in that case, the spacer would be the in-situ fluid for the cementing simulation. The operator typically requests a compatibility test from the fluid provider with the intended wash fluid and cement, which also yields rheologies of the individual fluids alongside different mixture concentrations. Furthermore, gel strength is also measured for the in-situ wash fluid (or spacer), since it may have gelled in the well in the waiting time between the washing and cementing phases (e.g., while batch mixing cement on the rig).

Job design and procedure

PWC jobs are designed according to specifications provided by the operator in combination with recommendations given by the tool specialists. Those include plug setting depth, required plug length, casing sizes, available drill pipes, inclination at depth, existing annulus fluids, planned wash/spacer/cement fluid densities and rheologies, type of perforations, etc. In this particular operation, a CFD model was constructed and run to validate the selected operational parameters, including perforation design, flow rates, and tool speeds, as described in the previous section. Therefore, the resulting job procedure accounts for the chosen parameters tested with the CFD analysis.

Ballistic perforations were considered during the initial discussions, but this was later engineered out due to challenges with casing integrity at the surface, causing the annuli to communicate. This is understood to come from holes in the 13-3/8" casing at circa 200 ft MD. Furthermore, a bridge plug was planned to be installed in advance of the PWC job to serve as the inner casing base, leaving an insufficient rathole for the spent guns. Therefore, the job was engineered with two trips, the first one with a 12" mechanical perforator, and then the second with a 12" hybrid PWC tool for washing and cementing. Details about the mechanical perforator can be seen in Jaculli et al., (2025b). Washing, spacer, and cement can always be done in a single trip, with the tool changing modes by ball-dropping as previously described. The job was engineered as a single barrier with a 100 ft plug length (5610–5710 ft MD), a 30 ft rathole, and a bridge plug set at 5740 ft MD. A pre-job log run confirmed poor cement in this interval. The 13-3/8" 68 ppf casing had an uncertain open hole diameter, which was assumed to be 18" in the cement volume calculations. The inclination at plug depth was nearly vertical

(maximum of 3 degrees in the interval per the survey).
One of the most significant elements in a PWC operation is the fluid environment. The fluid density required to control the pore pressure of exposed formations will impact the rheological properties of the fluids and potentially constrain the achievable density hierarchy for the cement operation. A large density difference between the cement and wash fluid will improve cement placement efficiency since in-situ fluids with low rheology are easier to displace than higher rheology fluids. An 11-ppg water-based mud (WBM) was selected as the wash fluid, which was equivalent to the annulus fluid from the drilling phase. The cement had a conventional 16 ppg. Thanks to good compatibility between the wash fluid and cement, a spacer was not deemed necessary.

The procedure for the hybrid PWC tool is very similar to the jet-based tool. For this particular well, the procedure was:

- Make-up (M/U) the hybrid PWC, with the jetting head, cementing valve, and top cup. Lower through the rotary table. Run-in-hole (RIH) with drillpipe to the top perforation. Without rotation, establish circulation with seawater and continue RIH to tag the bridge plug.
- Break the closest connection and drop a ball to activate the jetting head. Position the string slightly above the bridge plug setting depth. Pump the wash fluid (WBM), pressure up, and activate the jetting head at high pressure. Start circulation and rotation.
- Circulate at least 1x bottoms up with wash fluid with the BHA positioned below the bottom perforation. Pull-out-of-hole (POOH) above the perforation interval, positioning the tool at the top perforation. Wash down (1st pass) with seawater. Circulate at least 1x bottoms up with wash fluid while maintaining the BHA positioned below the bottom perforation.
- Perform a 2nd wash pass upward. Circulate at least 1x bottoms up with wash fluid with the BHA positioned above the top perforation until the fluid comes clean.
- RIH to position the cement diverter nozzle below the bottom perforation, and drop another ball on the first connection. Circulate the ball until it lands, and the tool switches modes.
- Position the cement diverter nozzle at the bottom perforation. Line up to the cement unit. Mix and (pump, pull, and rotate) PPR cement according to a pump table defined during job design, according to the cement volumes required to achieve the desired plug length and theoretical top of cement (TTOC). Displace the cement volume with the wash fluid until there is no cement left in the string. POOH the BHA above the TTOC and check that the tool is free to move.
- Drop another ball on the last connection to switch to circulation mode. Activate circulation sub by pumping to the land ball. Pressure will spike when the ball lands in the circulation sub. Shear open the circulation sub with high pressure. Circulate the hole clean. Install a sponge ball to clean the pipe as needed.
- Wait-on-cement (WOC) for subsequent barrier verification through tagging and pressure testing.

Not depicted in this summarized procedure are the pump rates, tool trip speeds, and tool RPMs used for each pumped fluid (wash fluid, spacer, and cement) at each operational step. An effort has been made to standardize these parameters after dozens of jobs have been performed in similar conditions (casing sizes and configuration, annulus conditions, shot density, etc.), but naturally, these values are revisited at each job design. This one, in particular, had its parameters validated by the CFD simulation, as discussed. Another important calculation is the cement volume necessary to produce the desired plug length, and this is also determined during job design according to input data provided by the operator for the well scenario.

Finally, no post-PWC job logging was planned as part of this job. Barrier verification would be achieved by tagging and pressure testing, combined with the validation of job parameters through the CFD simulation and a verification checklist of correct job execution.

Results and discussion

CFD model results

For improved resolution and quality assurance when analyzing the results, the annulus is divided into different volume sections for post-processing. Aside from analyzing the entire annulus, focus is also put on the low side (lower 20 degrees) and the high side (upper 20 degrees). The domain is split into 0.5-meter intervals for better visualization of the results.

Validation of the CFD simulations is performed by analyzing the volume fractions at the end of the simulation. The simulations are considered successful if the following criteria are met:

- All volume domains show volume fractions above the threshold: for washing, > 99% wash fluid in all volume cells (i.e., < 1% barite); for cement, > 95% cement in all volume cells.
- No continuous channels or microannuli, even if above threshold. Small pockets of unwashed barite can be accepted if not connected to other pockets, and only behind unperforated blank sections of perforating guns (i.e., where the guns connect).

Figure 8 illustrates the outcome of the washing simulation, in an isometric view of the wellbore cross-section. The first view focuses on the low side, while the second view focuses on the high side, and the third and fourth views focus on the laterals. We see from these results that good cleaning is achieved, since barite has been removed from the wellbore sections where the tool has passed through (indicated by the elimination of the brown color in favor of a transparent wellbore). This is confirmed by the wash fluid volume fractions being 99–99.5% in these wellbore sections, indicating that there is less than 1% barite left. The remaining 0.5–1% barite is simply a contamination caused while circulating from the bottom sections ahead of the tool, but not original in-situ barite. This result confirms that the operational parameters chosen for the washing phase are adequate. **Figure 9** (overleaf) shows the velocity profile at a selected time step. We observe high jet velocities at the wellbore wall, which is fundamental to achieving a thorough cleaning of the annulus.

It is also important that high flow velocities are seen in the annulus between perforations, which ensures that

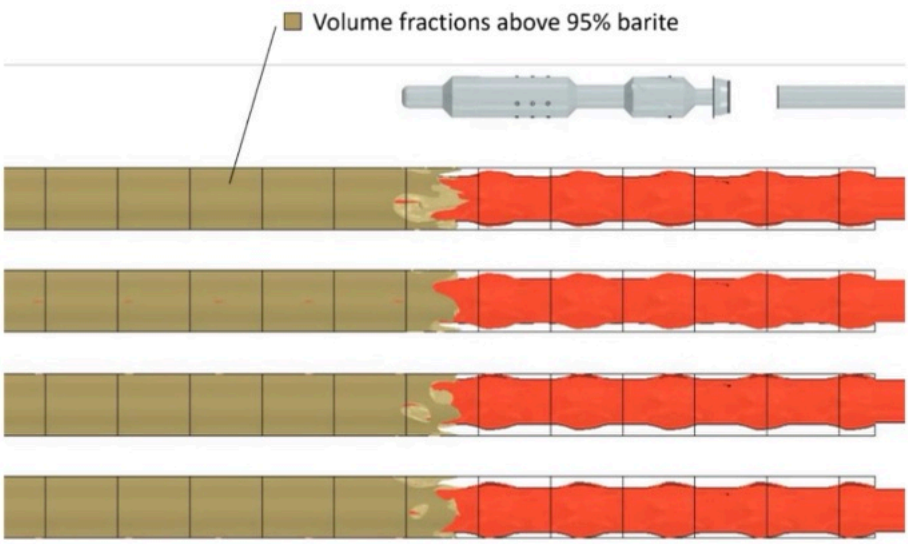

Figure 8—Washing simulation outcome, with the tool at the end position of Figure 6. The brown color indicates the initial condition of settled barite; it turns transparent when the barite content in that volume cell is below 5%.

the wash fluid flow is effective between perforations behind the casing.

Figure 10 (overleaf) illustrates the outcome of the cementing simulation, in an isometric view of the wellbore cross-section, similar to Figure 8. We conclude from these results that the cement is placed adequately in the interval, with cement coverage exceeding 95% throughout the whole annulus (indicated by the dark grey color filling up the wellbore), further assisted by the closed cup of the hybrid PWC tool. There are no uncemented channels or microannuli, and there are no pockets of wash fluid remaining in the annulus. This result confirms that the operational parameters chosen for the cementing phase are also adequate.

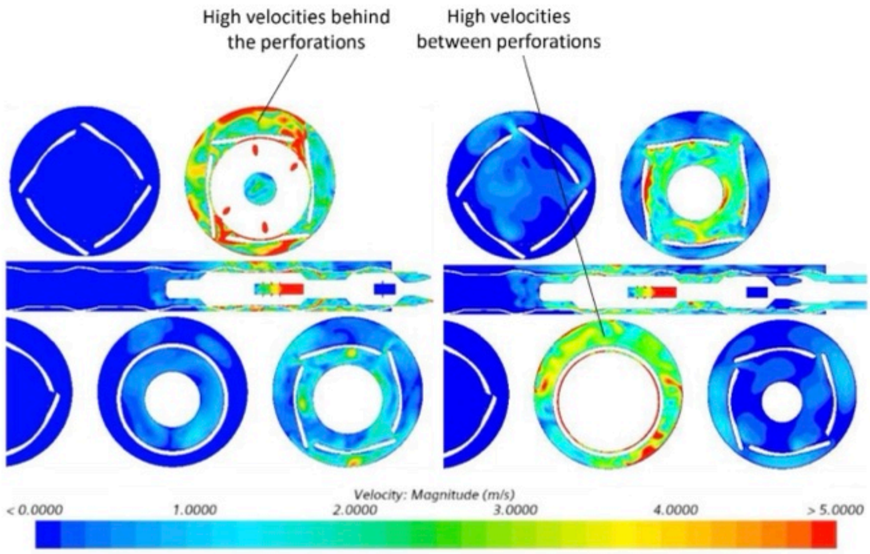

Figure 9—Washing simulation velocity profile. The circles are the cross-sections of the modeled wellbore at those positions.

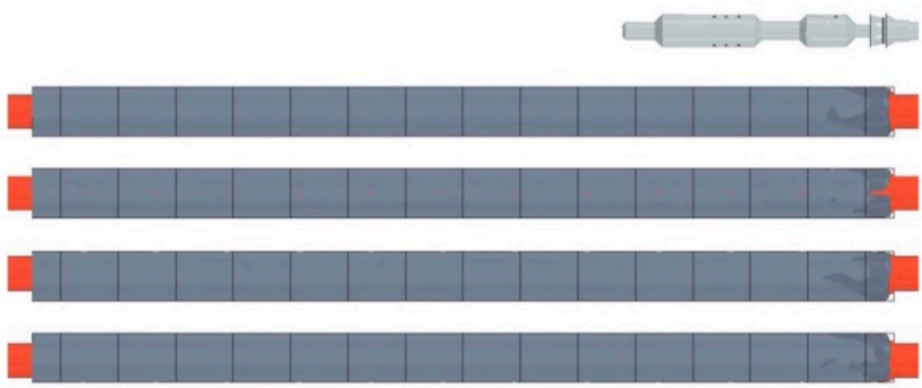

Figure 10—Cementing simulation outcome, with the tool at the end position of Figure 6. The dark grey color indicates that the cement volume fraction is above 95%.

Job outcome and barrier verification

Job execution went according to plan, without any major operational issues. After completing the 1st washing pass downward, no significant amount of material had been observed over the shakers; just some fine sand was noted mixed with barite. Again, after completing the 2nd pass, the same fine sand mixed with barite was noted, in a smaller quantity than the first pass. No cement returns were observed during the washing phase. The cement PPR sequence was then performed as planned, after doing a dummy run at the operator's request. Opened the circulation sub and dropped a foam wiperball while POOH, before finally laying down the tool and inspecting it, seeing no visible damage.

After waiting on cement for at least 24 hours, a 12-1/4" mill bit was RIH to tag the top of cement (TOC). An initial tag was made at 5307 ft MD. After discussing with onshore support, a decision was made to continue, managing to advance to 5318 ft MD without resistance before tagging again. Another decision was made to continue. The mill bit advanced and then started to feel increased resistance until reaching 5343 ft MD. Now a decision was made to stop and circulate the well clean. The final tag indicated a TOC higher (5343 ft MD) than what was expected (5450 ft MD, 107 ft difference) from the volume calculations, which can be explained by a false tag and/or a smaller open hole than initially expected.

- When cement is pumped into the well, it displaces wash fluid that is in there, creating a contamination zone at the interface of these two fluids. This zone will end up being atop the internal cement plug after WOC. Since this intermix has some cement content, it may develop enough strength to withstand tagging, giving a false tag indication. Furthermore, pulling tools out of the hole may induce a swab effect that can artificially increase the TOC by creating a cement sheath inside the casing. Drilling out at the tagged depth may reveal soft cement and allow the mill bit to continue RIH until reaching hard, uncontaminated cement. Another option is running a smaller OD mill bit to try to tag deeper.
- As mentioned above, there was an uncertainty in the open hole size, hence the assumed 18 for volume calculations. If the wellbore was actually smaller, then the difference in volume capacity of the B-annulus would result in extra cement volume being left inside the casing, increasing the TOC.

Tagging at the incorrect depth is a risk that had been identified and covered in the risk register prior to the operation. An assessment of the risk of contamination had been carried out ahead of the operation, expecting that contaminated cement could be found as high as around 5340 ft MD. Also, cement up to 5567 ft would have a low risk of contamination, which is above the top perforation, thus ensuring hard cement in the target PWC interval. After tagging, a test packer was installed 1500 ft above the plug to carry out the pressure test. The plug managed to hold the test pressure, thus confirming its integrity.

Job validation is achieved by the combination of correct operational execution, post-job verification (tagging and pressure), and confirmation by a favorable CFD. Furthermore, the validation also builds upon an extensive track record of the jet-based PWC tool (which is the basis for the hybrid tool since they share the same jetting head), which at that time included nearly 500 plugs installed, including seven in a 13-3/8" casing, two of which were logged and approved. The track record also includes plugs that had been installed in highly deviated wells, beyond the nearly vertical configuration of this well, and using mechanical perforations.

Conclusions

In this paper, we discussed a job performed with the hybrid PWC tool, which combines a jetting head with a top cup to improve cement placement in the annulus. The job parameters were validated using CFD simulations, which were then incorporated into the job design. The operation was successful, with the barrier being verified by tagging and pressure testing. A challenge with tagging was observed, which had already been addressed in the pre-job risk assessment. This paper contributes to increasing the PWC operational window to larger casing sizes, further confirming it as a method for remediation and permanent plug and abandonment.

Nomenclature

ALARP: As Low As Reasonably Practicable
BHA Bottomhole Assembly
CFD: Computational Fluid Dynamics
EAC: Element Acceptance Criteria
ICF: Internal Cement Foundation
MD: Measured Depth
MSAD: Minimum Safe Abandonment Depth
M/U: Make-up
OD: Outer Diameter
POOH: Pull Out Of the Hole
PPR: Pump, Pull, and Rotate
PWC: Perforate, Wash, and Cement
P&A: Plug and Abandonment
RIH: Run In Hole
TFA: Total Flow Area
TTOC: Theoretical Top Of Cement
TOC: Top Of Cement
WBE: Well Barrier Element
WBM: Water-Based Mud
WOC: Wait On Cement

References

Al Adawi, A., Mahrooqi, M. A., Mahruqi, I., Riyami, S. A., Yahmadi, S. A., Zeidi, A. A., & Rawas, A. A. (2024). Innovative Techniques for Managing Sustained Annulus Pressure in Highly Fractured Carbonate Field. *Day 2 Wed*, May 22, 2024, D022S007R004. https://doi.org/10.2118/220593-MS

Allapitchai, M. S. M., Johan, A. L., Heboul, E. K. M. M., Sellapan, S., Liew, W. S. Y ., Ahmad Zaini, A. H., Abdul Razak,M. H., & Yaakub, M. Y . (2021). Annulus Perforate, Wash and Cement: Establishing Barrier Verification Process for Deepwater Subsea Wells Abandonment and Its Lessons Learnt. *Day 1 Tue*, November 30, 2021, D011S002R003. https://doi.org/10.2118/208492-MS. Downloaded from onepetro. org/ SPEBERG/ proceedings-pdf/ 26BERG/ 26BERG/ D011S012R003/ 5359836/ spe-231877-ms. pdf by Schlumberger Oilfield UK Plc user on 23 August 2026SPE-231877-MS 13

Allapitchai, M. S. M., Johan, A. L., Liew, W. S. Y ., Sellapan, S., M'Bareck, K. O. M., Ahmad Zaini, A. H., & Abdul Razak, M. H. (2023). A Systematic Approach in Methodology for Permanent Plug Placement in Deepwater Subsea Plug and Abandonment Campaign. *Day 2 Thu*, March 02, 2023, D021S027R003. https://doi.org/10.2523/IPTC-22892-MS

Ansari, A., Al-Azizi, B., & Larsen, A. G. (2017). Innovative Remediation Techniques for Restoring Well Integrity by Curing High Annulus-B Pressure and Zonal Communication. *Day 1 Wed*, April 05, 2017, D011S005R005. https://doi.org/10.2118/185911-MS

Ansari, A. A., Libdi, Z., & Larsen, A. G. (2016a). Innovative Planning and Remediation Techniques for Restoring the Well Integrity by Curing High Annulus-B Pressure and Zonal Communication. *Day 3 Wed*, November 16, 2016, D031S041R002. https://doi.org/10.2523/IPTC-18894-MS

Ansari, A. A., Ringrose, D., Libdi, Z., & Larsen, A. G. (2016b). A Novel Strategy for Restoring the Well Integrity by Curing High Annulus-B Pressure and Zonal Communication. *All Days*, SPE-181905–MS. https://doi.org/10.2118/181905-MS

Azihar, A. A., Abu Mukhtar, M., Yang, S., A Razak, M. Z., A Rajab, A. Z., & Tumiran, M. A. (2022). Biggest Wells Plug and Abandonment Campaign – Effective Management & Best Practices Implementation. *Day 3 Thu*, March 24, 2022, D031S019R003. https://doi.org/10.4043/31403-MS

Bothamley, R., Haigh, M., & Soudi, M. (2020). Installation of Annulus Cement Plugs Using Perforation, Wash and Cement Technique, a Lookback from a First for Australia. SPE Asia Pacific Oil & Gas Conference and Exhibition, D013S102R002. https://doi.org/10.2118/202430-MS

Chukwuemeka, A. O., Oluyemi, G., Mohammed, A. I., & Njuguna, J. (2023). Plug and abandonment of oil and gas wells – A comprehensive review of regulations, practices, and related impact of materials selection. *Geoenergy Science and Engineering*, **226**, 211718. https://doi.org/10.1016/j.geoen.2023.211718

Dahmani, L., Joppe, L. C., & Dekker, V. (2022). A Low Impact Rigless Well Abandonment Solution for Complex Wells. *Day 2 Wed*, March 23, 2022, D021S010R005. https://doi.org/10.2118/209047-MS

Delabroy, L., Rodrigues, D., Norum, E., Straume, M., & Halvorsen, K. H. (2017). Perforate, Wash and Cement PWC Verification Process and an Industry Standard for Barrier Acceptance Criteria. *Day 1 Wed*, April 05, 2017, D011S003R004. https://doi.org/10.2118/185938-MS

Delabroy, L., Stokkeland, T. A., Astrand, G., & Norum, E. (2018). Perforate Wash and Cement for Large Casing Sizes. *Day 2 Tue*, December 04, 2018, D022S003R003. https://doi.org/10.2118/193945-MS

Ferg, T. E., Lund, H.-J., Mueller, D., Myhre, M., Larsen, A., Andersen, P., Lende, G., Hudson, C., Prestegaard, C., & Field, D. (2011). Novel Approach to More Effective Plug and Abandonment Cementing Techniques. *All Days*, SPE-148640–MS. https://doi.org/10.2118/148640-MS

Govil, A., Obando Palacio, G. A., Middleton, R., Constable, K., Hovda, L., & Mueller, D. (2024). Improved Logging Techniques and Interpretation Experiences to Evaluate Perforate-Wash- Cement Intervals. IADC/SPE International Drilling Conference and

Exhibition, D021S017R001. https://doi.org/10.2118/217712-MS Ho, C. Y. (2018). Malaysia's First Subsea Fields Abandonment. *Day 1 Mon*, December 03, 2018, D011S002R003. https://doi.org/10.2118/193959-MS

Hovda, L., Mueller, D., Phadke, A., Nevoey, H., & Gonuguntla, P. (2024). Lessons Learned from 150 Jet-Type Perforate,Wash and Cement Well Abandonment Operations. IADC/SPE International Drilling Conference and Exhibition, D011S009R002. https://doi.org/10.2118/217690-MS

Hovda, L., Phadke, A., Mueller, D., Stevens, J., Ryan, A., & Nevøy, H. (2020). Best Practice for Cementing and Zonal Isolation Using the Jet-Type Perforate, Wash and Cement Technique. SPE Asia Pacific Oil & Gas Conference and Exhibition, D013S103R010. https://doi.org/10.2118/202397-MS

Hurtado, N., Zapata, F., Alzaabi, A., BinKalban, M., Karmstaji, M., & Roicki, K. (2024). Extending Well Life and Securing Well Integrity Efficiently. ADIPEC, D041S130R002. https://doi.org/10.2118/222408-MS

Jaculli, M. A., Iuell, M., Engelsgjerd, E., Knudsen, E. A., Amdal, S., Andersen, P., Haukelid, S. I., & Vemmestad, S. (2025a). Perforate, wash, and cement: A review of practices and where to go next. *SPE Journal*, 1–13. https://doi.org/10.2118/226204-PA

Jaculli, M. A., Engelsgjerd, E., Andersen, P., Knudsen, E. A., Iuell, M., Holm, I., Butcher, S., Beazer, D., Mignano, J., & Ashton, J. (2025b). Usage of a Coiled Tubing PWC Tool to Abandon Two Wells with Surface Casing Vent Flow on Onshore Australia. SPE Symposium - Asia Pacific Decommissioning and Well P&A, D021S005R003. https://doi.org/10.2118/228568-MS

Joneja, G., Nafikova, S., Reid, J., Rublevskyi, A., & Salazar, J. (2018). Perf-and-Wash Cement Placement Technique as a Cost-Effective Solution for Permanent Abandonment of a Well with Multiple Permeable Zones: A Case Study from North Sea, UK. IADC/SPE Drilling Conference and Exhibition, D011S005R005. https://doi.org/10.2118/189580-MS

Kehlenbeck, D. II, & McNicol, J. (2023). Abandonment Barrier Placement with Novel Analysis Spells Success in Deepwater. SPE/IADC International Drilling Conference and Exhibition, D031S024R003. https://doi.org/10.2118/212444-MS

Khalifeh, M., & Saasen, A. (2020). Introduction to Permanent Plug and Abandonment of Wells (V ol. 12). Springer International Publishing. https://doi.org/10.1007/978-3-030-39970-2

Kueh, J. Z., Hassani, H., B Zamzuri, M. D., B Johan, A. L., B Zainal Abidin, M. Z., B Abdussalam, K., B Yusop, Z., & B A Razak, M. A. (2018). Cap Rock Restoration in Well Abandonment: Fit-for-Purpose Well Abandonment Design through Workflow Optimization and Integrated Assessment. *Day 1 Mon*, December 03, 2018, D011S003R003. https://doi.org/10.2118/193965-MS

Leeson, T., & Larsen, A. G. (2020). When can Perforating, Wash and Cement PWC Reduce Abandonment Costs? SPE Asia Pacific Oil & Gas Conference and Exhibition, D013S101R004. https://doi.org/10.2118/202344-MS

Lucas, A., Stokkeland, T. A., Jackson, D., & Ingram, S. (2018). Improving the Understanding, Application and Reliability of the Perforate, Wash and Cement Technique through the Use of Cement Bond Logs, Tool Enhancements and Barrier Verification via Annular Pressure Monitoring. SPE Annual Technical Conference and Exhibition, D022S054R001. https://doi.org/10.2118/191528-MS

Mohamad, S. I., & Joppe, L. C. (2022). An Electrifying Integrated Solution Towards a Safe and Environmentally Sound Well Abandonment in Urban Setting. *Day 3 Thu*, March 24, 2022, D031S019R006. https://doi.org/10.4043/31394-MS

Mokhtar, S. R. M., Wibisono, R., & Zakaria, M. Z. (2019). How Malaysia Late Life Field Benefited From Well Intervention Efficiency Improvements Through Integrated Operations. SPE Annual Technical Conference and Exhibition, D021S030R004. https://doi.org/10.2118/195843-MS

Moreira, R. P. M., De Oliveira, A. G. G., Lucchesi, R. D., Piedade, T. S., Ribeiro, D. B., Ferreira, F. K., Filho, G., Almada, L. S., Tier, L., Oliveira, G., Lima, H., Jaculli, M., Tocalino, S. D., & Engelsgjerd, E. (2025). Use of PWC Technique for Abandonment in Deepwater Scenarios: Overview and Lessons Learned from Operations in Brazil. *OTC Brasil*, D031S029R002. https://doi.org/10.4043/36084-MS

NORSOK D-010. (2021). Well integrity in drilling and well operations, 5th revision.
OEUK. (2022). Well decommissioning guidelines, issue 7.

Othman, F., Teo, C. H., & Bakri, F. (2018). Malaysia's First Subsea Development Well Plug and Abandonment. *Day 2 Tue*, December 04, 2018, D021S007R002. https://doi.org/10.2118/193980-MS
Pollard, M. (2021). Qualification process for P&A Perforate, Wash, Cement (PWC) (tech. rep.). https://www.havtil.no/en/explore-technical-subjects2/technical-competence/reports-fromprojects/2021/technology- and-methods-for-permanent-plugging-on-the-ncs/
Razak, M. A. A., Rajab, A. Z. A., Chew, J. S., Chesson, J. B., & Lim, S. (2021). Pushing the Operational Envelope of a Cap-Rock Restoration Campaign Utilizing Perforate Wash Cement Technology and a Hydraulic Work Over Unit Offshore Malaysia. *Day 3 Thu*, March 25, 2021, D031S010R003. https://doi.org/10.2523/IPTC-21367-MS

Teo, C. H., Bakri, F., Koh, Q., Mat Jusoh, M. F., Bin Alias, S. H., Othman, A., Idris, S., & Thien, R. (2020). Dual Casing Perforate Wash and Cement for Annular Isolation. SPE Asia Pacific Oil & Gas Conference and Exhibition, D023S008R002. https://doi.org/10.2118/202292-MS

Teo, C. H., Stokkeland, T. A., Matthews, P., Helleren, A., & Sainuddin, A. K. (2018). Dual Annuli Closed System Perforate, Wash and Cement. *Day 1 Mon*, December 03, 2018, D011S005R002. https://doi.org/10.2118/193989-MS

Thomson, I. (2018). Successful Creation of Permanent Reservoir Isolation Barriers Using Coiled Tubing on the NorwegianContinental Shelf NCS. *Day 2 Wed*, March 28, 2018, D021S009R003. https://doi.org/10.2118/189956-MS

Torvestad, B. T., Stokkeland, T. A., Fliss, A., Zapata Bermudez, F., Fagna, J. O., Fossdal, T., & Carlsen Stanghelle, M. (2022). Perf, Wash and Cementing Technique Remediates Cemented Annulus to Achieve High Quality Bond Across the Entire Interval in Complex Slot Recovery Operation. SPE Asia Pacific Oil & Gas Conference and Exhibition, D031S015R004. https://doi.org/10.2118/210783-MS

Vrålstad, T., Saasen, A., Fjar, E., Oia, T., Ytrehus, J. D., & Khalifeh, M. (2019). Plug & abandonment of offshore wells: Ensuring long-term well integrity and cost-efficiency. *Journal of Petroleum Science and Engineering*, **173**, 478–491. https://doi.org/10.1016/j.petrol.2018.10.049

Vrålstad, T., Skorpa, R., & Saasen, A. (2018). Rheological Properties of Barite Sediments in Water-Based Drilling Fluids. *Volume 8: Polar and Arctic Sciences and Technology; Petroleum Technology*, V008T11A068. https://doi.org/10.1115/OMAE2018-78695

Yang, S. M. Yusoff, M. H., Abdullah, I. A., M Ros, M. I., Devadass, L., Othman, A., Stokkeland, T. A., Matthews, P., & Sainuddin, A. K. (2019). Plugging & Abandonment of Multiple Zones in One Run Using Perforate Wash and Cement on Hydraulic Workover Unit. *Day 1 Mon*, November 11, 2019, D011S003R001. https://doi.org/10.2118/197149-MS

Yusof, M. H., Ros, M. I., & Omar, M. A. (2018). Well Decommissioning Campaign in Block SK305, Sarawak, Malaysia 7 Production Wells and 9 Suspended Subsea Mud Line Suspension Exploration Wells. *Day 1 Mon*, December 03, 2018, D011S004R004. https://doi.org/10.2118/194054-MS

Zulkipli, S. N., & Saw, L. J. (2019). Knowledge and Experiences Combined under One Hood: Lessons Learned from Peninsular Malaysia Well Abandonment Campaign. *Day 2 Wed*, December 04, 2019, D021S007R004. https://doi.org/10.2118/199200-MS

Zulkipli, S. N., Shuib, S. N., Saw, L. J., & Harun, N. (2018). Maximizing Value from Well Abandonment through Shallow Gas Hunting and Integrated Well Surveillance. *Day 2 Tue*, December 04, 2018, D021S008R003. https://doi.org/10.2118/193974-MS

Meet the SPE London Board 2026

The Society of Petroleum Engineers (SPE) is a not-for-profit professional association with more than 140,600 members in 144 countries engaged in oil and gas exploration and production. The SPE London board oversees SPE London activities, including evening programmes. Our various committees have specific focus, including Young Professionals, Women in Energy, Net Zero and associated student chapters. As well as engineers, we also welcome qualifications in geology, geophysics, earth science, environment, health and safety, mathematics, information technology, management and economics.

The SPE London Board brings together a diverse group of professionals from operators, service companies, consultancy and academia. The team's expertise spans reservoir engineering, wells, consulting, CCUS and digital transformation, and it is united by a commitment to advancing knowledge, supporting members, and driving the energy transition through collaboration, education and community engagement.

Chair

Mehdi Alem is a Reservoir Engineer at bp with experience across the North Sea, North Africa, and the Middle East. A graduate of Imperial College London (MSc) and UCL (MEng), he has been active in SPE for over eight years and is passionate about the role subsurface plays in building a sustainable energy future.

Past Chair

Adam Borushek is a London-based Principal Advisor, Reservoir Engineer with RISC. With 25+ years' experience, he provides technically and commercially sound advice in the areas of asset acquisition, development, field management and reserves reporting to clients in the financial, investment and upstream sectors.

Chair Elect

Shwan Dizayee is a Manager Management Consulting at Accenture, combining consulting expertise with hands-on petroleum engineering experience. With over a decade of industry experience, Shwan specialises in digital transformation, strategy, operating model design, and energy transition.

Treasurer

Farid Hadiaman is a Performance Advisor, based in London, UK. Farid has lived in Asia Pacific, Caspian Sea, Russia, Europe, UK, and the Middle East. He has authored/co-authored 10+ SPE papers and journals, served as SPE Balikpapan Section Chairman and is an SPE 2012 Regional Services Award recipient (Asia Pacific).

SPE Review London Editor

Elizaveta Poliakova is a Senior Well Performance Engineer with subsurface background at Trident Energy. She studied Petroleum Engineering at Leeds (BSc) and Imperial College London (MSc) and has been involved with SPE for more than seven years. A former SPE London Chair, she previously led both the Imperial and Leeds student chapters.

Net Zero

Max Richards is Group Business Development Manager at OPC, where he leads the energy transition practice and carbon storage projects.

He holds an MSc in Geoscience from UCL, where his research focused on CO_2 mineralisation in partnership with CarbFix and Aramco.

YP Chair

Yasir Mumtaz is an experienced reservoir engineer who has worked with operators and in the service sector.

He is currently advancing CCS simulation projects while drawing on his background in production optimisation and

Continuing Education

Khaled Al Marei is Principal Reservoir Engineer at Storegga, with 20 years of experience in reserves audits and CCS subsurface modelling. He is passionate about professional development and supporting young geoscientists through education and mentoring.

Alejandro Primera is a Digital Operations Domain Champion at SLB. As a software developer, he enjoyed framing and executing ideas into apps solving complex problems. As an engineer he is a keen learner of the challenges that energy transition will pose in the next few years.

Frank Folorunso
(more information coming soon)

Hani Hamoud is an Energy Consultant at Accenture. He works at the intersection of energy, commercial strategy, and the technology that's starting to reshape both. At Accenture, he advises energy clients on the problems where commercial outcomes, regulatory complexity, and emerging technology collide.

Inter-society

Carolina Coll is Director, CCUS and Energy Storage, at Miller and Lents, with more than 25 years of global experience. She plays a leading role in international committees on reserves, CCUS, and energy storage, and has been a driving force in SPE initiatives.

Malvika Nagarkoti is a Business Development Director with Baker Hughes. She is a production optimisation and reservoir engineering leader with 17+ years of experience in delivering value across global oil & gas assets.

Programme Chair

Andrew Mynors is VP Business Development Manager with Petram Group. He has a demonstrated history of working in the industry, and is an IT professional skilled in gas, petroleum, operations management, coaching, and pore Pressure Prediction.

Women in Energy Chair

Isabel Asenjo is a Senior Reservoir Engineer at Sasol with 20+ years' experience in oil and gas developments and commercial evaluations, having worked in both oil companies and the consultancy sector. Her expertise is reservoir modeling, and she has contributed to diverse studies spanning the life cycle of developments, from exploration and appraisal to development and field life extension in assets worldwide. A long-time SPE volunteer, she now chairs Women in Energy, encouraging a more gender-balanced workforce.

Communications

Afrah Siddique is an energy professional with 10+ years international experience in reservoir engineering, oil and gas, CO_2 sequestration, geothermal energy and hydrogen storage. She holds an MSc in Petroleum Engineering from the Colorado School of Mines and has worked across the USA, UK and Middle East. Afrah is deeply committed to advancing the net-zero energy transition and brings this passion to her role on the SPE London Section board, and her contributions to several SPE committees.

Students

Omer Khoshnaw is a Reservoir Engineer at INEOS, working on a gas asset in the UK Southern North Sea.

With a background in consultancy and training, he enjoys collaborating with teams and helping students connect with industry.

Sponsorship

Phuc Truong is an engineer with Perenco, passionate about solving upstream challenges from artificial lift to well interventions. Having worked across four countries with Canadian, Japanese, and French operators, he thrives on tackling the complexities of ultra-mature fields.

Carolina Barros is the Director of Growth at Kongsberg Digital. Reporting to the Chief Commercial Officer, responsible for profitability, sales pipeline, and worldwide commercial activities for real-time data management products and solutions. She is a champion for innovation and women in leadership, and hosts the ‘A energia pelo olhar Delas’ podcast.

Social Chair

Leo Ngyuen is a management graduate and early-career professional currently working at Perenco.

He holds an MSc in Management from University College London and a First-Class BSc in Management and Entrepreneurship.

Membership

Arsenij Fiodorov is a Senior CCS Flow Assurance Engineer at Pace. His work includes flow assurance modelling of the transportation system of CO2 captured from hydrogen production sources, developing feasible operating envelopes, and mapping constraints of the complex transportation and injection system, carrying impure CO2 with high H2 content for offshore sequestration.

Lester Clark is the founder of Don't Delay Reality, (DDR), a decision-governance framework focused on improving clarity, alignment and execution under pressure. He works with leaders, founders and organisations navigating AI acceleration, complex change, strategic uncertainty and high-stakes decision environments.

SPE events calendar – local and international

LOCAL – UK

Ongoing through 2026 (London, England)
London SPE events

Energy on Draft!
Quarterly social evenings open to all experienced professionals and career starters within the energy industry. Come along to catch up with friends and make new connections over drinks!

Tech Talks
Monthly events on various topics of interest to industry professionals. Speakers include Distinguished Lecturers.

Net Zero webinars: Insights and more.
More information: **SPE London**

September 24, 2026 (London, UK)
SPE London Energy Cup 2026

This tournament offers a fantastic opportunity to connect with peers in the energy sector while enjoying friendly competition on the pitch. Whether you are joining as an individual player or as part of a team, the event promises an engaging and inclusive experience for all skill levels. Teams of professionals and students.; participation from the energy sector and academia; networking opportunities; and an exclusive Energy on Draft social event.
More information: **Tournament**

INTERNATIONAL

September 15–16, 2026 (London, UK)
IADC/SPE Managed Pressure Drilling & Underbalanced Operations Conference/Exhibition

Technologies designed to control annular pressure during drilling, inclusive of underbalanced drilling, managed pressure drilling and dual gradient drilling are being used in many forms around the world. UBD continues to maximize reservoir performance, while MPD techniques spanning onshore performance drilling and offshore deep and shallow water prospects serve to enhance drilling safety and minimize NPT.
More information: **Conference**

September 22–24, 2026 (Texas, USA)
SPE Permian Basin Energy Conference and Exhibition

Stay ahead in the evolving landscape of energy production, where innovation meets tradition in the heart of the Permian Basin. Dedicated to fostering technical knowledge-sharing and facilitating the exchange of operational best practices, this event helps to shape the future development and performance of wells in the Permian Basin. Learn about the latest innovative technologies and research best practices.
More information: **Conference**

September 29 – October 1, 2026 (Dubai UAE)
GOTECH. Energy, Technology and Innovation

Under the patronage of His Highness Sheikh Ahmed Bin Saeed Al Maktoum, Chairman of the Dubai Supreme Council of Energy, GOTECH is at the Dubai World Trade Centre, UAE. This conference and exhibition is a key gathering of global thought leaders shaping the future of the oil and gas industry. GOTECH continues to be a cornerstone event for professionals committed to advancing the energy sector. Organised in collaboration with SPE.
More information: **Conference**

November 24–26, 2026 (Istanbul, Turkiye)
SPE Annual Caspian Technical Conference and Exhibition

The event brings together operators, service companies, technology providers, and industry leaders from across the Caspian region. The programme covers exploration and subsurface characterisation, drilling and well construction, mature field management and IOR/EOR, gas development, midstream facilities, and the growing role of digital technologies and AI in improving operational performance.
More information: **Conference**

For a complete listing of all events on the SPE Global Events Calendar: spe.org/en/events/calendar/
And, for more information about SPE training courses, calls for papers, and opportunities for SPE London sponsorship: SPE London

SPE policy on AI-generated content in publications

The SPE Board has approved a new policy allowing AI-generated content to be used within SPE publications under specific conditions.

AI-assisted language tools (such as ChatGPT) have gained widespread attention recently, particularly for their capability to assist in drafting scientific papers. While these tools have the potential to enhance the efficiency and speed of academic and technical writing, the ethics and best practices for their use are still evolving. These tools may generate useful information and content but are also prone to errors and inconsistencies.
The SPE Board has approved a new policy for authors who use AI language tools to generate content for their papers. The policy states that AI-generated content may be used within SPE publications but under specific conditions.

• AI language tools may not be listed as an author. The AI tool cannot sign publishing agreements or transfers of copyright.

• Any AI-generated content that is used within a manuscript should be thoroughly vetted, fact checked, and disclosed.

• If AI language tools are used within a manuscript, their use should be clearly explained within the methodology or acknowledgment section of the paper. If AI-generated content is included within a manuscript without an explanation, this can be grounds for rejection of the work at the discretion of SPE and may result in a code of conduct review.

• The authors of the manuscript will be held responsible for any errors, inconsistencies, incorrect references, plagiarism, or misleading content included from the AI tool.

It is important to note that technology for AI language tools is advancing rapidly. SPE plans to periodically review and update this policy to ensure its relevance and effectiveness. Any modifications to the policy will be communicated transparently and in a timely manner.

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