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MAY/JUNE 2025 | OEDIGITAL.COM | VOL. 50, NO. 3

From SWAMP RIGS to FLOATING WIND

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DEPARTMENTS

In business and life, I aim to simplify.

While I'm not an engineer, trust that I know there is nothing 'simple' about the process of effectively, efficiently discovering and recovering energy in the offshore environment. But with all of noise consistently swirling around and within this industry – from geopolitical to environmental to financial to legislative and all stops in between – to me the 'simplification' of all matters offshore energy comes down to people like **Calvin Norton**, a recently retired, 60-year employee of Friede & Goldman who is the walking definition of 'An Engineering Life.'

We had the pleasure to host Norton recently on a video interview for **Offshore Engineer TV**, and he offered a level of insight and anecdotes that you can only find by talking to someone that has honed his craft for six decades. Norton was a budding engineer when the business of offshore oil and gas exploration was literally in its infancy, and along the way he has worked and lived through the industry's myriad peaks and troughs. He discuss the successes, the tragedies and what he sees as the future in offshore energy in his expansive interview. Watch the video for the story in Norton's own words, or read the abridged version in this edition: *"From Swamp Rigs to Floating Wind: Calvin Norton Reflects on 60 Years of Offshore Engineering."*

In looking at the future, the 'green' side of offshore energy continues to be a driver for technology evolution. **Wendy Laursen** reports in her feature *"Biofouling Challenges Plague Offshore Structures"* found that when Seadrill wanted to relocate the West Hercules from Norway to Canada, 2,200 nautical miles away, and biofouling was a concern for fuel efficiency and for the invasive species risk it posed. Read Laursen's story to see how Seadrill addressed the challenge, teaming with a heavy-duty ROV solution was able to do the job, removing more than 78 ton of marine growth.

Check out the 2025 Media Kit via the QR Code Below

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OE OFFSHORE ENGINEER
THE FUTURE OF OFFSHORE ENERGY & TECHNOLOGY.

Vol. 50 *No. 3*
ISSN 0305-876x *USPS# 017-058*

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OE WRITERS


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Michelle Yeo is a Market Analyst at Fearnley Offshore Supply, covering the offshore support vessel market, including both O&G and renewables. Based in Singapore, she focuses on macroeconomic drivers and supply-side dynamics shaping the offshore sector, with an emphasis on developments in the Asia Pacific and Middle East regions. Michelle holds a Bachelor of Science in Maritime Studies from Nanyang Technological University and brings a nuanced regional lens to market fundamental and emerging trends.

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The SEA Offshore Market: Today's Reality, Tomorrow's Outlook

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Oil price weakness remains a key concern for most stakeholders in the industry. With prices hovering in the low to high 60s these days, this reflects a decline of more than 20% compared to a year ago. This recent dip in oil prices stems from several months of unwinding OPEC production adjustments, compounded by turbulent geopolitical developments. Together, these forces have stirred uncertainty across the market, casting a fog over the outlook and hinting at deeper, potentially structural, shifts taking shape beneath the surface.

By Michelle Yeo, Market Analyst, Fearnley Offshore Supply AS

In light of these developments, Rystad Energy have revised their May global greenfield commitment outlook to $85 billion this year, representing a 35% decrease compared to their outlook just a month ago. Several oil majors have also adjusted their spending forecast for this year, with ENI announcing a reduction of 6% in gross CAPEX expenditure while ConocoPhillips quoting a reduction of 5%. Other key oil producers have also reported cuts between 2% and 10%. While it remains unclear whether these cuts will translate into lower E&P activity, many of the oil majors have reiterated their commitment to maintaining overall production targets.

Global macroeconomic headwinds place us at a critical inflection point, setting the stage for a new paradigm as stakeholders recalibrate market positioning and plan for the coming decade. The depth and duration of the current muted price environment remain uncertain, but the overall long-term outlook remains promising. Regional commitments point to continued momentum through 2029, with average E&P vessel spending projected to grow by

5% in Asia Pacific and 4% in the Middle East.

Meanwhile, major offshore engineering contractors are also steadily building their backlogs. These backlog figures demonstrate the expected elevated levels of offshore upstream activity anticipated in the medium term, particularly as energy companies ramp up capital investment in oil and gas projects, in regions like the Middle East and Latin America. As of 2025 to date, Tier 1 EPC contractors report a combined backlog of $49.5 billion – the highest level seen in the past five years.

Although some project decisions have been delayed due to oil price volatility and shifting economic feasibilities, contractors remain optimistic about long-term demand. Offshore projects remain a preferred investment avenue for operators, with deepwater projects attracting a growing share of global capital, buoyed by improved project economics over the years. However, this could evolve as the industry navigates the shifting sands of geopolitics, which continue to cast uncertainty over oil prices and investment timelines.

Promising Medium-Term Outlook for Southeast Asia OSV Market

In the Southeast Asia OSV market, the tides have turned since last year, following the wider global macro trends. Just a year ago, vessel availability was limited and considered a prized asset in a bustling market. Today, a significant pool of vessels has empty windows between jobs, seeking employment in a slower-moving market. Dark clouds hover as projects face delays and softer market sentiment weighs on near-term demand. However, these dark times will pass soon, as committed vessel budgets and planned project expenditures point to a more promising medium-term outlook, with increased rig activity combined with a tightening vessel supply. Moreover, deferred project timelines pave the way for an uptick in activities in the latter half of the decade.

Taking for example the Salam-Patawali project off Malaysia, ConocoPhillips have pulled the plug resulting in a delay in the project progress. With a greenfield commitment expected at $1.7 billion, it is unlikely that Petronas will be able to move ahead with the project alone. Similarly in Thailand, PTTEP has suspended its Lang Lebah project and delaying it till next year. While no exact reason has been stated, it is believed that the political dynamics in Sarawak have contributed to market unease for operators working therein.

That said, the OSV market in Southeast Asia remains resilient, bolstered by encouraging forecasts for operational rigs and the current state of supply vessels. Based on a working fleet of 37 rigs – and assuming each deploys two AHTS and one PSV – this translates to demand for approximately 74 AHTS and 37 PSVs. At first glance, the region's 200 AHTS (which only accounts for the 60 to 80-ton class, the typical workhorses) and 90 PSV fleet appear adequately sufficient and healthy. However, a deeper look at vessel age and operational readiness suggests otherwise. The average age of the fleet today is 16.5 years, and excluding vessels above 25 years, 17% of the current fleet is due for retirement by 2030. Moreover, both AHTS and PSV are routinely deployed for a broader range of offshore operations beyond rig support – including FPU support, towage, and standby duties – all of which contribute to intermittent demand that places additional pressure on an ageing fleet.

Looking ahead to 2026, and excluding vessels above the age of 25, we count a total of ~190 AHTS and ~75 PSV. With minimal newbuilds in the pipeline and deliveries expected mostly from late 2026, the rate of asset replenishment will lag behind retirements – tightening the market further.

And this trend is already visible in today's market. During peak activity, newer tonnages are snapped up quickly, leaving older units to compete for fewer jobs. Interest in newbuilds remains tepid in this region, as traditional own-

ers are reluctant to wait two to three years for delivery – especially amid ongoing market volatility. As a result, the S&P market has seen increased interest; however, the limited availability of vessels that meet buyers' criteria continues to constrain options.

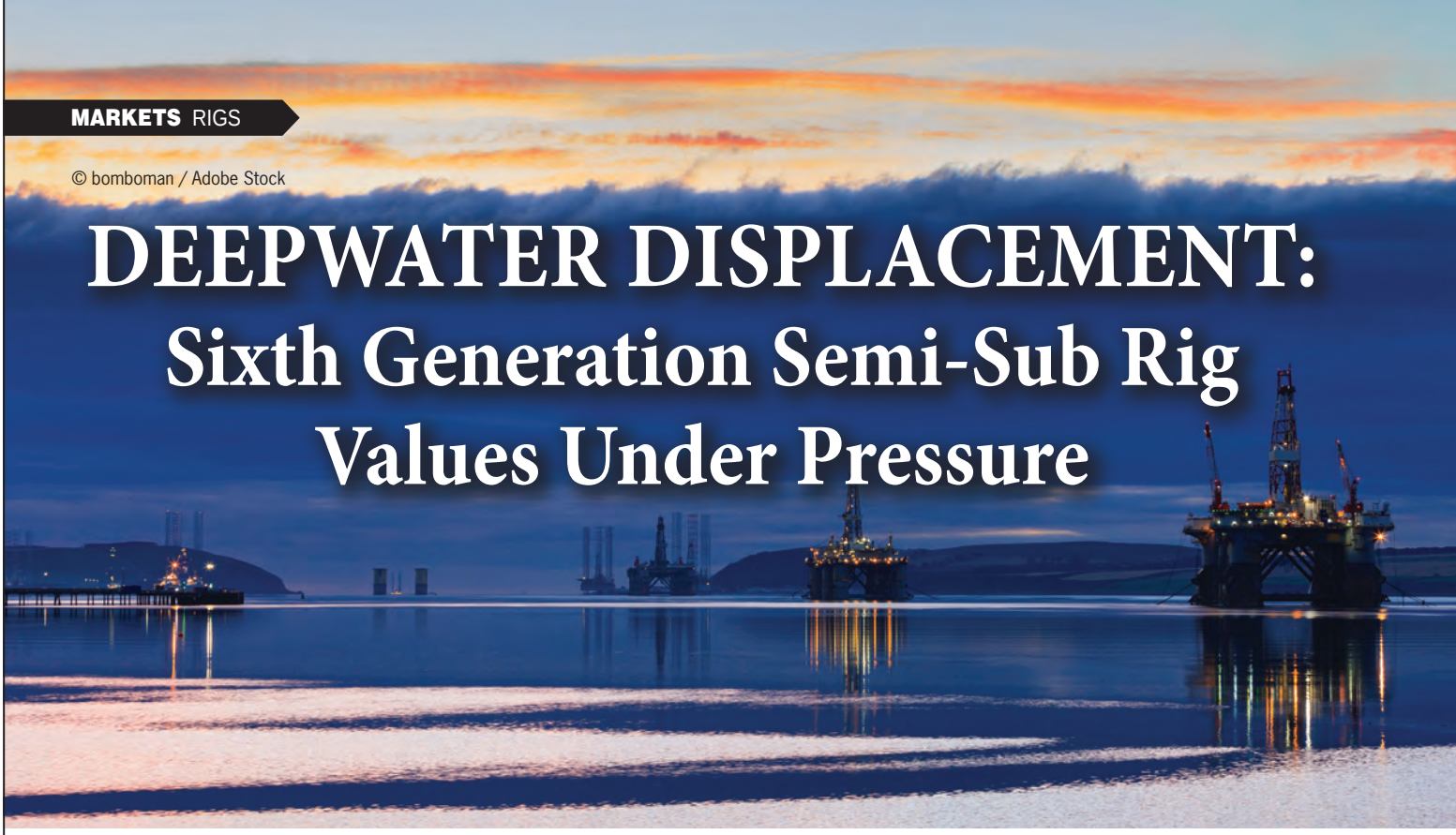
Heightened offshore activity in the Middle East has historically helped absorb excess vessel supply from Southeast Asia and has become even more pronounced in recent months. However, as activity in Southeast Asia begins to pick up in tandem from next year onwards, vessel availability could tighten quickly, potentially posing a supply challenge. Additionally, with the series of awards materializing in Southeast Asia, we can expect a higher rig activity level into 2026 and 2027. Outstanding tender requirements for jackups in 2026 continue to drive demand forecast and based on the forecast for the number of working rigs, we are expecting an increase of 20% in 2026 and 10% in 2027, compared to today's level.

Future OSV Demand to Increasingly Come from Alternative Markets

Consequently, the expected dearth of newbuilds, combined with an ageing fleet, would continue to drive upward pressure on vessel rates and utilization. The majority of the coldstacked fleet is also unlikely to rejoin the fray, as reactivation remains largely economically unfeasible given their extended laid up status – particularly since over 80% of these stacked units have been stacked for more than 5 years. This narrows the true count of active, market-ready tonnage and sharpens the sense of looming scarcity.

The supply conditions today countervail the weakened demand as reflected, suggesting that a new market paradigm is emerging – one that requires heightened sensitivity and adaptability. Future demand will not only come solely from traditional oil and gas scopes but increasingly from alternative markets as well. Rising focus on CCS, offshore wind, and decommissioning, while individually in modest volume, adds up collectively to the demand pull for the same assets. At the same time, an ageing fleet and limited replenishment exacerbate constraints. This bodes well for owners with operational tonnage but presents a challenge for contractors. Without proactive planning, the market may find itself underprepared when the next upcycle arrives. The question is not just whether we have demand – but whether we will have the right fleet ready to meet it.

The industry still bears the scars of the 2014 cycle, when a wave of overbuilding – driven by overly optimistic demand projections – flooded the market with new vessels just as oil prices collapsed. The result was a prolonged downturn marked by oversupply, weak dayrates, and widespread vessel idling. Today, the risk is not oversupply but undercapacity, especially as ageing units retire and newbuild activity remains subdued. Without a measured and forward-looking response, we could swing from one extreme to another – again finding ourselves caught off guard, but this time due to a lack of fleet readiness when demand rebounds. As geopolitics cast new shadows and macro shifts stir the waters, the course we chart now will determine how well we weather the next storm.



DEEPWATER DISPLACEMENT: Sixth Generation Semi-Sub Rig Values Under Pressure

As the offshore rig market recalibrates, sixth generation international semi-subs are facing a dual challenge - limited demand and declining rig values. While more modern units remain competitive, the wider category is being squeezed from within the floater segment, as drillships absorb a growing share of deepwater work. In a market where competitiveness is rapidly evolving, rig values are revealing the segment's growing struggle to retain its former role.

By Sofia Forestieri, Senior Analyst, Esgian

Cold-Stacked Rigs: Strategic Exit or Re-Entry Candidates?

As of June 2025, nine sixth-gen international semi-subs are cold-stacked globally. These include units stacked as recently as early 2025 to others idle for nearly a decade. For many of these long-idled rigs, a return to drilling appears increasingly unlikely, and recycling/conversion is becoming the default outcome.

Recent moves by Valaris underscore this shift. The company sold three of its Ensco 8500-design rigs, Valaris DPS-3, DPS-5, and DPS-6, for recycling. Notably, DPS-5 was working less than a year ago, and had only been cold-stacked since early this year, but was retired alongside the others, reflecting the growing emphasis on strategic fleet optimization. Other long-term cold-stacked units could also likely follow this path.

List of cold-stacked 6th generation intl. semisubs

Nine semisubs are cold-stacked: Values in million USD

Name	Owner	Days stacked	Delivered	Full Design Category	ERV* min	ERV max
Bicentenario	IPC	3114	2011	GVA 7500	33	43
GSP Deep Driller	GSP	2719	2005	F&G ExD	36	44
West Eclipse	Seadrill	2458	2011	F&G ExD	38	46
Centenario GR	Operadora Cicsa	2367	2010	F&G ExD	38	46
GSF Development Driller I	Transocean	1591	2005	F&G ExD	38	46
Sevan Developer	Cosco	1258	2021	Sevan 650	28	36
Bluewhale II	Bluewhale Offshore	620	2019	Frigstad D90	99	109
Frida 1	MGM	171	2011	GustoMSC TDS-2500	38	47
Development Driller III	Transocean	148	2009	KFELS/MSC DSS51	62	73

*Esgian Rig Values; Source: Esgian Rig Values

The GSP Deep Driller (cold-stacked for 2,669 days) is being marketed by Vantage Drilling for a specific opportunity under a MoU signed with GSP, but its extended stacking time still marks it as a recycling candidate. Noble's 1976-built Ocean Apex, even though currently drilling, could still be a potential retirement case as the company continues to optimize its fleet following the Diamond Offshore acquisition.

Three sixth-gen international semi-subs were sold for recycling this year, a trend likely to continue. Additionally, four rigs have been sold for drilling purposes since early 2024, highlighting the shrinking resale market.

With reactivation costs estimated to range from $60 to $100 million, the economics of returning cold-stacked rigs to work are challenging. Even short-term stacked rigs see $40 to $50 million valuation discounts versus comparable active rigs. For example, GVA 7500-design Independencia 2, currently warm-stacked in Mexico, is valued at $104 to $115 million, while same design long-term cold-stacked Bicentenario is valued at $33 to $43 million. A similar case is F&G ExD-design Hunter Queen and Ocean Courage, currently drilling in Brazil, valued at $81 to $93 million, while same design long-idle West Eclipse and Centenario GR are valued at $38 to $46 million. Considering that scrap value typically ranges between $4 - 6 million for a sixth generation international semi-sub, this highlights the narrow economic gap between reactivation potential and retirement, especially for stranded rigs.

Demand & Utilization: A Clear Shift Towards Drillships

Demand trends clearly reflect a steady operator preference for drillships over semi-subs, especially in regions like Brazil, West Africa, and the U.S. Gulf. Originally, the semi-sub fleet supported pre-salt development in Brazil and early deepwater frontiers. But as drillships brought superior efficiency, greater storage capacity requiring less field support services, and higher specification capabilities, they quickly became the preferred choice.

This is very clear when analysing demand and utilization for floaters since 2018. In 2018, global demand averaged 23 semi-subs versus 64 drillships. By 2025, semi-sub demand has fallen 22%, averaging just 18 active rigs, while drillship demand has increased by 25%, now averaging 81 rigs globally. Semi-sub competitive utilization has hovered around 60% since the pandemic recovery, fluctuating with regional demand, while drillship utilization has remained stronger, in the low 80% range. Contracting activity for semi-subs has also slowed,

6th generation intl. semisub sales

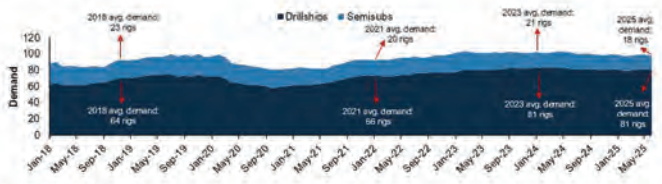
2024 – present; Sale price in million USD

Sale date	Name	Sales type	Seller	Buyer	Sale price
Apr-25	Valaris DPS-3	Recycling	Valaris	Undisclosed	3.3
Apr-25	Valaris DPS-5	Recycling	Valaris	Undisclosed	3.3
Apr-25	Valaris DPS-6	Recycling	Valaris	Undisclosed	3.3
Jun-24	SSV Catarina	Drilling	UMAS 1	Ventura Offshore	130
Jun-24	Hakuryu-16	Drilling	Transocean	Japan Drilling	53.5
May-24	SSV Victoria*	Drilling	Petroserv	Ventura Offshore	-
Feb-24	Explorer	Drilling	Noble	Caspian Drilling	25

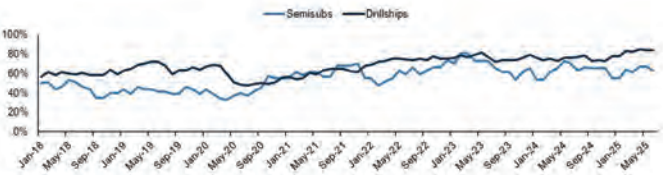
* Sold together with the Carolina drillship for $281 million
Source: Esgian Rig Values

Demand and Utilization

Floater demand*



Floater competitive utilization**



*6th gen intl. semisubs and drillships.
**Competitive utilization is the number of rigs currently drilling divided by the competitive fleet.
Source: Esgian Rig Analytics

particularly as operator interest concentrates in high-spec rigs, as mentioned. West Africa and South America are selectively awarding work to newer rigs, leaving older sixth-gen international semi-subs sidelined. The result is a two-speed market: one segment approaching full utilization, and another facing prolonged inactivity.

Fleet Valuation: Heavily Affected by Current Market Cycle

Valuations for sixth-gen international semi-subs have fallen sharply since January 2024, driven by a weakening in the market and macroeconomic pressures.

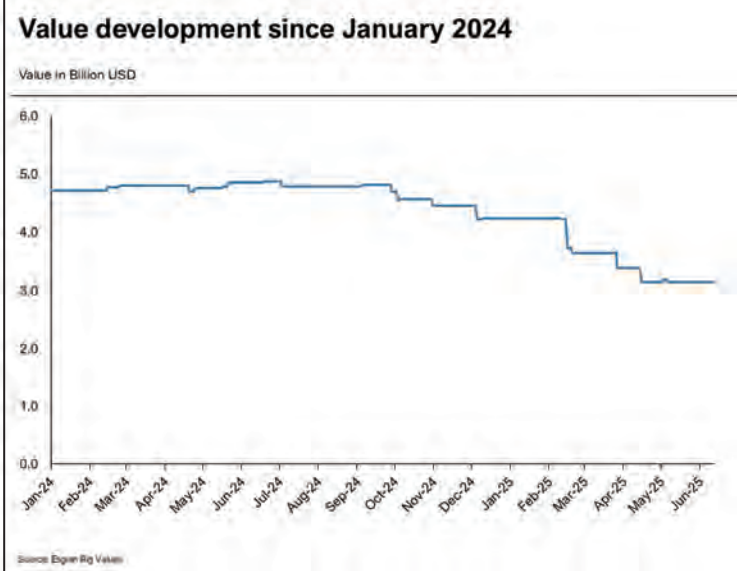
Esgian Rig Values data shows that the total semi-sub fleet value has dropped from $4.7 billion in January 2024 to $3.1 billion as of May 2025. A 13% reduction in 2024 reflected growing white space and weaker floater demand, while an additional 26% cut so far in 2025, followed ongoing market uncertainty, new U.S. tariffs, and OPEC+'s announcement of production increases. The average rig value now stands at $82 million, with cold-stacked rigs marked down by nearly 50%.

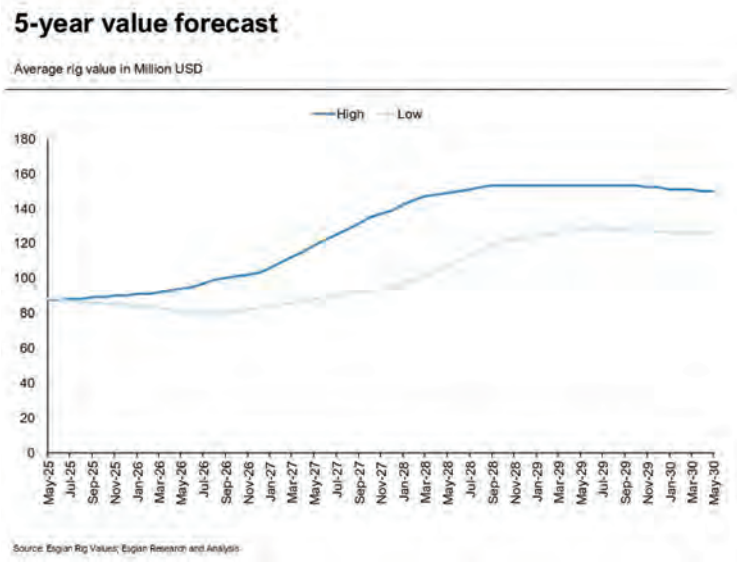
Rig values have always tracked market cycles closely, rising and falling with changes in demand, supply overhang, and macro shifts. But among floater categories, sixth generation international semi-subs have been more acutely impacted in this cycle. An aging fleet, reactivation costs, declining demand, a narrowing buyer base, and competition from newer or more regionally suited designs have all combined to push values down faster and further than for harsh-environment semi-subs and drillships.

Looking Ahead: Forecast through 2030

The short-term outlook remains cautious. Even though most of the market negativity has already been considered, Esgian forecasts a flat to slight value decline through late 2025, followed by a gradual recovery starting in late 2026. Values are expected to peak between $125 - 150 million by early 2029, assuming a tightening rig supply, sustained deepwater activity, and no major economic shocks. This marks a notable downward revision from the December 2024 forecast, highlighting how quickly sentiment can shift.

The market for sixth-gen international semi-subs is entering a new phase: for owners holding cold-stacked rigs, the opportunities are shrinking. For active units, maintaining commercial and technical competitiveness is critical as regional demand becomes increasingly selective. And for the market at large, success will depend on clarity: in strategy, capital discipline, and timing.





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Chevron's 20K Anchor Off to Strong Start with Top Tier Well Performance

Chevron's Anchor project achieved first oil in August 2024 from two wells, marking the first development in the Inboard Lower Tertiary and initiating the deepwater 20,000 psi (20k) era. Despite reservoir uncertainty, early results are promising as AP001 delivered approximately 15,500 bbl/d and AP002 aound 18,500 bbl/d. Eleven wells are planned in total, with current performance indicating strong development potential, with arly well results demonstrating outperformance.

By Milan Patel, Analyst, North America Upstream Research, Welligence Energy Analytics

Discovered in 2014, Chevron's Anchor field targets Lower Tertiary Wilcox reservoirs at vertical depths of 30,000–34,000 ft. Four appraisal wells were drilled, including Anchor #2, which encountered 690 ft of net pay across the Wilcox 1–4 sands. Anchor #3, drilled three miles northwest, confirmed a separate northern fault block, delineating the broader field structure.

Two production wells were drilled in early-2023 and brought online in August 2024. Both were completed across approximately 890 ft of net pay, utilizing five and six hydraulic fracturing stages respectively. Current production is sourced from the Wilcox 1–3 intervals, with Wilcox 4 targeted for future development. Core and log analyses indicate reservoir quality varies across the four sands, with permeability ranging from 1 to 100 mD and porosity between 18–24%.

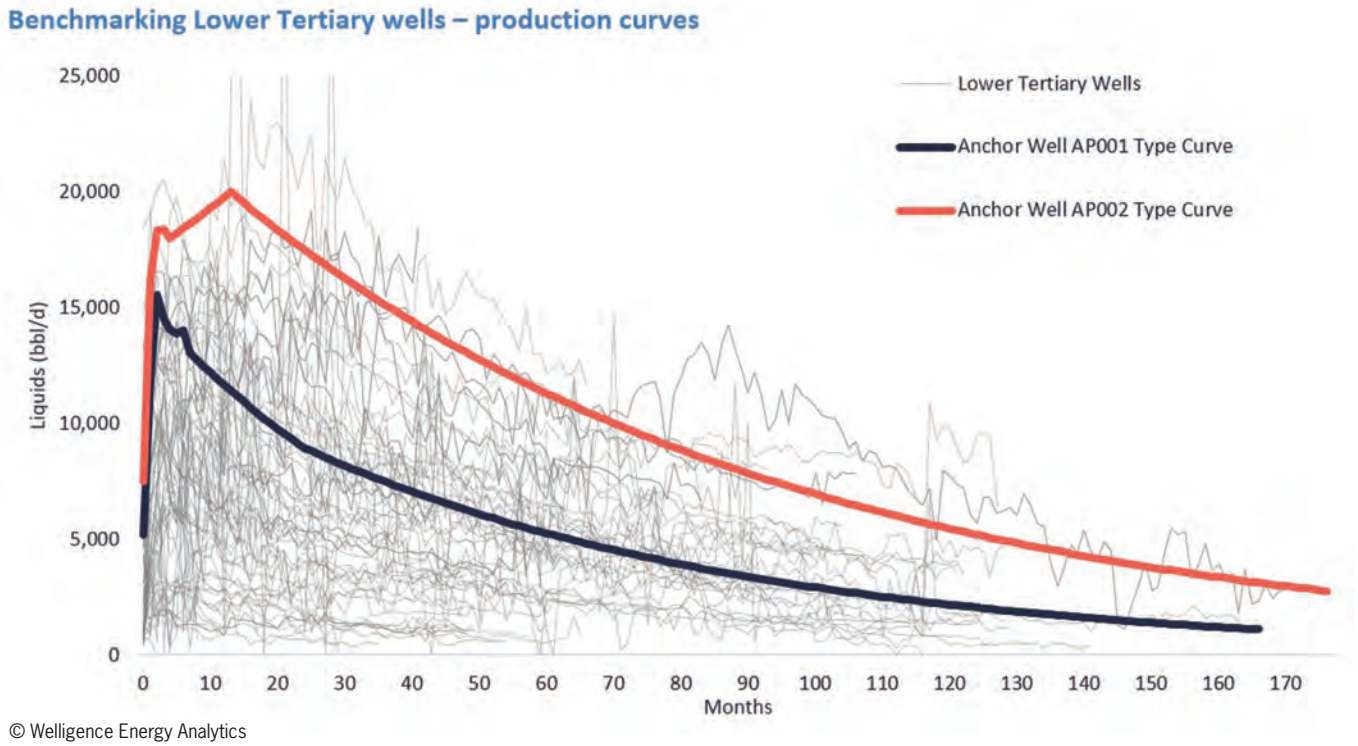
Anchor well performance is Top Tier in the Lower Tertiary

The initial Anchor wells compare favorably to recent Lower Tertiary developments. A benchmarking analysis against a reference set of Outboard Lower Tertiary and Perdido fields (brought online within the past 15 years) shows Anchor's 3 and 6-month cumulative production volumes in the 80th–95th percentile range. Normalized over the first 90 days, Anchor wells exceed the Lower Tertiary average by 60–70%, placing them among the most productive in the Gulf of America/Mexico basin to date.

The Inboard Lower Tertiary is characterized by elevated pressures, with Anchor reaching 16,700 psi – this necessitates the use of 20k-rated equipment. The Inboard play features superior reservoir quality relative to the Outboard, characterized by coarser-grained sands, higher porosity and permeability, and larger structural traps. In the central Inboard, the thick overlying salt complicates seismic imaging and drilling but moderates thermal gradients, creating a cooler HPHT regime at extreme depths. For reference, Perdido well perforations average ~15,000 ft TVD, Outboard wells range from 25,000–28,000 ft TVD, while Anchor exceeds 30,000 ft TVD.

Could We See Reserve Upgrades at Anchor?

With two wells online and early production exceeding expectations, Anchor shifts into full-scale Phase 1 development. Five additional wells are planned over 2025-2027, bringing the total to seven producers tied back to a 75,000 bbl/d semi-submersible FPU, focused on the southern fault block. Phase 2 will target the northern fault block with up to four wells. Waterflooding remains a potential



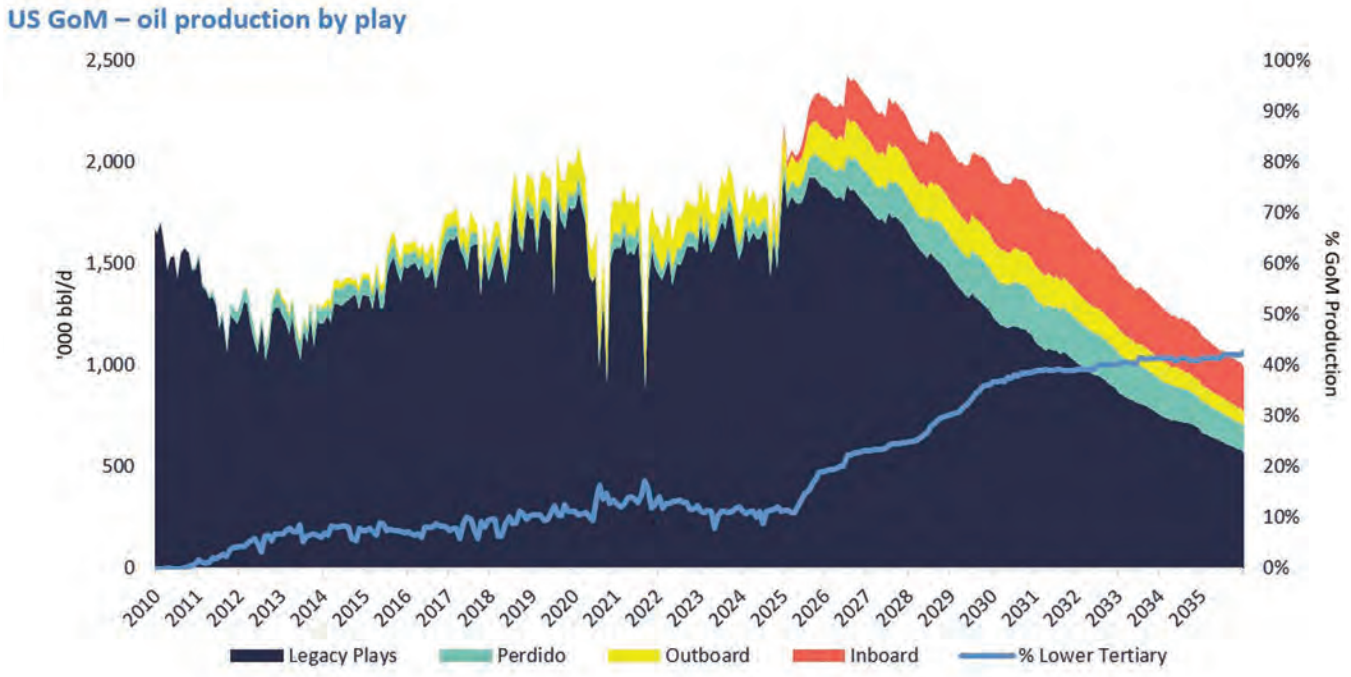
future option. Chevron estimates ultimate recovery at ~440 MMboe.

Recent BSEE regulatory updates have increased the allowable downhole commingling pressure differential in Wilcox reservoirs from 200 psi to 1,500 psi. Operators may now combine multiple zones with broader pressure variation, subject to fluid compatibility and safety standards. In the context of the Inboard Lower Tertiary, where Wilcox pay intervals may exceed 1,000 ft, this change is expected to significantly reduce drilling and completion costs while enhancing recovery efficiency through multi-zone completions. DOI estimates the new rule could boost production by up to 10%.

What's Next – All Eyes on Shenandoah as 20K Trend Builds Momentum

Chevron's Anchor marks the beginning of a new wave of large-scale 20k developments in the Gulf of America/Mexico, with several high-pressure projects slated to come online by decade's end. Currently, the Lower Tertiary contributes over 300,000 bbl/d to deepwater US GoM production, a figure that will grow significantly as more 20k projects come online. Within the next decade, we forecast the Lower Tertiary will account for nearly 50% of total deepwater production in the US GoM, including:

- **Shenandoah:** The Beacon Offshore Energy project is scheduled for start-up in June 2025, with four wells online by year-end. The 120,000 bbl/d semi-sub FPU will be expanded to 140,000 bbl/d under Phase II. The facility will serve as a regional hub, with tiebacks from Monument (2026) and potentially Shenandoah South (unsanctioned).
- **Sparta:** Formerly North Platte, the project was sanctioned by Shell in December 2023. Development will utilize a 100,000 bbl/d semi-sub FPU, similar to the Major's Vito and Whale. First oil is targeted for 2028.
- **Kaskida**: Sanctioned by bp in July 2024, Kaskida will be developed through an 80,000 bbl/d semi-sub FPU with first oil expected in early-2029. The company plans to follow with Tiber (FID expected 2026), also a standalone facility. Gila, Guadalupe, and Chevron's Gibson may be tied in later. bp estimates the broader Kaskida-Tiber area could hold up to 10 Bnboe of recoverable resources.



RESTORING U.S. OFFSHORE ENERGY DOMINANCE: THE MOMENTUM IS REAL

By Erik Milito, President, National Ocean Industries Association (NOIA)

America's offshore energy future is at a turning point. After years of political headwinds, we're finally witnessing a decisive shift in Washington that is embracing the United States' position as a global offshore energy leader. The Trump administration's early moves, combined with momentum in Congress, offer a path forward that prioritizes energy security, economic growth, and technological innovation—all while laying the groundwork for more efficient permitting and expanded investment.

But this is only the beginning. What happens next—especially through budget reconciliation and follow-on permitting reform—will determine whether we unlock the full potential of our offshore resources or continue ceding ground to global competitors.

Reclaiming the Offshore Advantage

The Gulf of America has long been a powerhouse of American energy production. It provides some of the lowest-emission barrels of oil in the world and generates billions in federal revenue that supports infrastructure, conservation, and coastal restoration. But over the past several years, federal leasing policy has failed to keep pace with our energy needs and global opportunities.

The current 2024–2029 Five-Year Leasing Program, finalized under the previous administration, includes only three offshore oil and gas lease sales—the lowest number in program history. This self-imposed scarcity undermines a stable investment environment, stifles innovation, and signals uncertainty to the domestic and global markets.

Thankfully, the Trump administration took action to fix this failure early. Through executive and secretarial orders, it has prioritized energy production on federal lands and waters, directed agencies to resume oil and gas lease sales and develop a new leasing program, and streamline permitting.

The Trump administration has sent a strong message: the Gulf of America matters.

Congressional Action: Laying the Legislative Foundation

The real opportunity to cement this shift, however, lies with Congress. And the gears are already turning.

As part of budget reconciliation efforts, lawmakers are advancing provisions to mandate regular offshore lease sales—effectively overriding the restrictive five-year plan—for the next 15 years. This step is critical. By requiring the Department of the Interior to hold lease sales on a predictable schedule, Congress is restoring certainty to the process and ensuring the United States maintains a robust offshore leasing pipeline.

But Congress isn't stopping at lease sales. Bipartisan discussions are already underway to address permitting bottlenecks that have plagued both traditional oil and gas projects and, hopefully, emerging offshore sectors like wind, carbon capture and storage (CCS), and critical mineral recovery.

Smart permitting reform—one that maintains rigorous environmental reviews while streamlining the process—is essential for maximizing the benefits of offshore energy development. We cannot afford multiyear delays that kill projects before they start.

The Ripple Effect of Offshore Energy

Offshore energy is not an isolated industry. It supports a vast and diverse supply chain, spanning steel fabrication, vessel services, marine engineering, advanced manufacturing, and skilled labor. In the Gulf Coast and beyond, thousands of workers rely on a strong offshore energy industry to provide good-paying, stable jobs.

Today's offshore energy ecosystem is also more diverse than ever. Oil, gas, and wind aren't in competition—they're collaborating. And when these sectors grow together, the result is a more resilient and innovative energy landscape.

Consider the companies supporting offshore wind development today. Many of them—including vessel operators and subsea construction firms—have deep experience in the oil and gas sector. A healthy leasing schedule across all offshore resources keeps this industrial base strong, supports workforce development, and fosters cross-sector innovation.

Looking ahead, the United States has an opportunity to lead in next-generation offshore technologies. Carbon capture and storage, for example, will rely on offshore geological formations for long-term CO_2 sequestration. Likewise, as the demand for minerals like cobalt and rare earth elements rises, deep-sea mining could provide further opportunities for the offshore oil and gas sector and play a role in diversifying our supply chains.

All of this depends on a strong foundation of offshore activity. And that starts with predictable lease sales, permitting reform, and federal policies that recognize the strategic value of American offshore energy.

A Global Race We Can Still Win

Global energy demand is on the rise—and it's not slowing down anytime soon. As populations grow and developing nations lift themselves into the middle class and a new AI and data-driven economy emerges, the world will need drastically more energy, not less. Offshore resources, especially oil and gas, will be essential in meeting that demand while supporting global stability and economic development.

America has a unique opportunity to lead—but only if we act with urgency. Other nations have already recognized what's at stake. Authoritarian regimes like Russia and China are leveraging their own energy resources—both fossil and renewable—as geopolitical tools.

Russia wants to use oil and gas exports as leverage over Europe and other regions. China, meanwhile, is investing heavily in offshore wind, subsea mining, and critical mineral supply chains, securing dominance in the energy technologies of the future.

If the United States fails to fully engage its own offshore capabilities, we risk ceding both economic opportunity, global leadership, and national security interests. A strong offshore energy strategy serves as a powerful hedge against the ambitions of our adversaries. It also enables us to be a reliable energy partner to allies around the world, providing better, lower-emission energy than many of our global competitors.

This isn't just an energy issue. It's a foreign policy and national security imperative.

America's offshore industry has the tools, talent, and technology to lead. We simply need the policy framework to match. With the right decisions now, we can grow our economy, meet global demand, and ensure the United States—not our adversaries—sets the tone for the next era of global energy leadership.

THE KEYS TO MANAGING OFFSHORE ENERGY RISK & UNCERTAINTY

These are complex times for the offshore industry. More than any other point in its history a major shift is taking place as moves are made to adapt to the changing demands of energy markets and society at large. Faced with the challenge of the 'energy trilemma' and an increasingly unpredictable geopolitical environment, the need for strategic planning, collaboration, and flexibility is greater than ever.

By Torgeir Sterri, SVP, Director Offshore Classification, DNV Maritime

Decarbonization Driving Change

Central to the great changes taking place is the question of decarbonization. The offshore industry contributes significantly to global oil and gas industry emissions, and the need to reduce these emissions and enhance operational efficiency has driven the exploration of new ways to decarbonize.

From electrification of offshore platforms to the adoption of renewable energy solutions, the industry is embracing innovation to achieve its sustainability and performance objectives.

This is being enhanced by digitalization. A digital revolution is taking place as novel technologies and data-driven solutions enable new ways of working, enhancing safety, reliability, and efficiency, while also driving cost savings.

The Evolving Energy Picture

At the same time, a wider and more fundamental shift is taking place. Oil remains central to the global energy mix, and it is estimated that there will be a substantial deficit of oil coming into the 2030s , unless new developments materialize. Gas is widely regarded as a bridging fuel for the energy transition, and global demand has never been higher, prompting increased investment in offshore assets such as FPSOs.

That we are witnessing a shift towards renewable energy sources is clear, however.

Offshore wind production continues to rise. For example, DNV's 'North Sea Forecast: Ocean's Future to 2050' report, highlights the rapid growth of offshore wind in the North Sea, projected to claim 9% of the North Sea space by 2050, compared to under 2% this year.

Other areas like fish farming and mineral mining are also increasingly prominent, further indicating the evolving and diversifying ocean space.

Geopolitical Tensions Creating More Uncertainty

In the face of this uncertainty, the offshore industry needs to adapt. This demands innovation, collaboration, and forward thinking with this, ideally, supported by a progressive and stable regulatory environment.

However, today's geopolitical tensions are often having the opposite effect, sending mixed signals to investors and key decision makers, and causing confusion.

The recent actions of the current US administration are one example of this. The Inflation Reduction Act (IRA) created significant opportunity for tax reduction and government grants towards renewable projects. However, the current administration's new focus towards oil and gas, has led to decreased investment and interest in the renewable space.

The practical effects of this are already being felt, with key developments, like the Empire Wind 1 project off the coast of Long Island recently halting construction.

Moves like this have understandably had an impact throughout the value chain.

The Complex Energy Trilemma

Amid all this uncertainty, stakeholders across the offshore industry are understandably searching for ways to create more stability. Leaving the added instability of political developments aside, most companies in the space are wrestling with the challenge of the 'energy trilemma' – the simultaneous but sometimes contradictory achievement of environmental sustainability, energy security, and affordability.

This is no easy task as offshore companies strive to optimize resources, remain profitable, and continuously maintain energy supply in the face of market and geopolitical challenges, while also making moves to reduce emissions and reach decarbonization goals.

Maintaining Asset Integrity

Extending the operational life of assets, while maintaining asset integrity is one way to balance these demands. Many offshore units have surpassed the 15-year mark on locations that still have years to go on production, prompting operators to find the best ways to prolong their lifespan in a safe and sustainable manner.

Doing this correctly will enable operators to avoid replacing these assets, helping them to reap significant cost savings. However, it is crucial that this is done in a way that integrates modern, digitalized systems, meeting decarbonization demands, while maintaining safety and reliability.

Finding a Sustainable Way Forward

Reaching the desired balance of the 'energy trilemma' can also be achieved by adopting a strategic approach over the entire lifecycle of an offshore asset. This means applying rigorous standards and best practices from the bottom up, starting with design and construction, and maintaining these through to operation and decommissioning. Doing this will ensure that assets and operations are safe, reliable, and compliant with modern standards, meeting the expectations of the entire offshore industry, and its stakeholders.

Further, balancing the continued need for oil and gas with renewable energy sources requires strategic investments and collaboration across various sectors. Embracing green technologies is critical to achieving carbon reduction goals and ensuring a cleaner, sustainable future. However, this must be integrated with energy security, while also ensuring that economic growth aligns with social equity, and a respect for the ocean space.

Growing with the Ocean Space

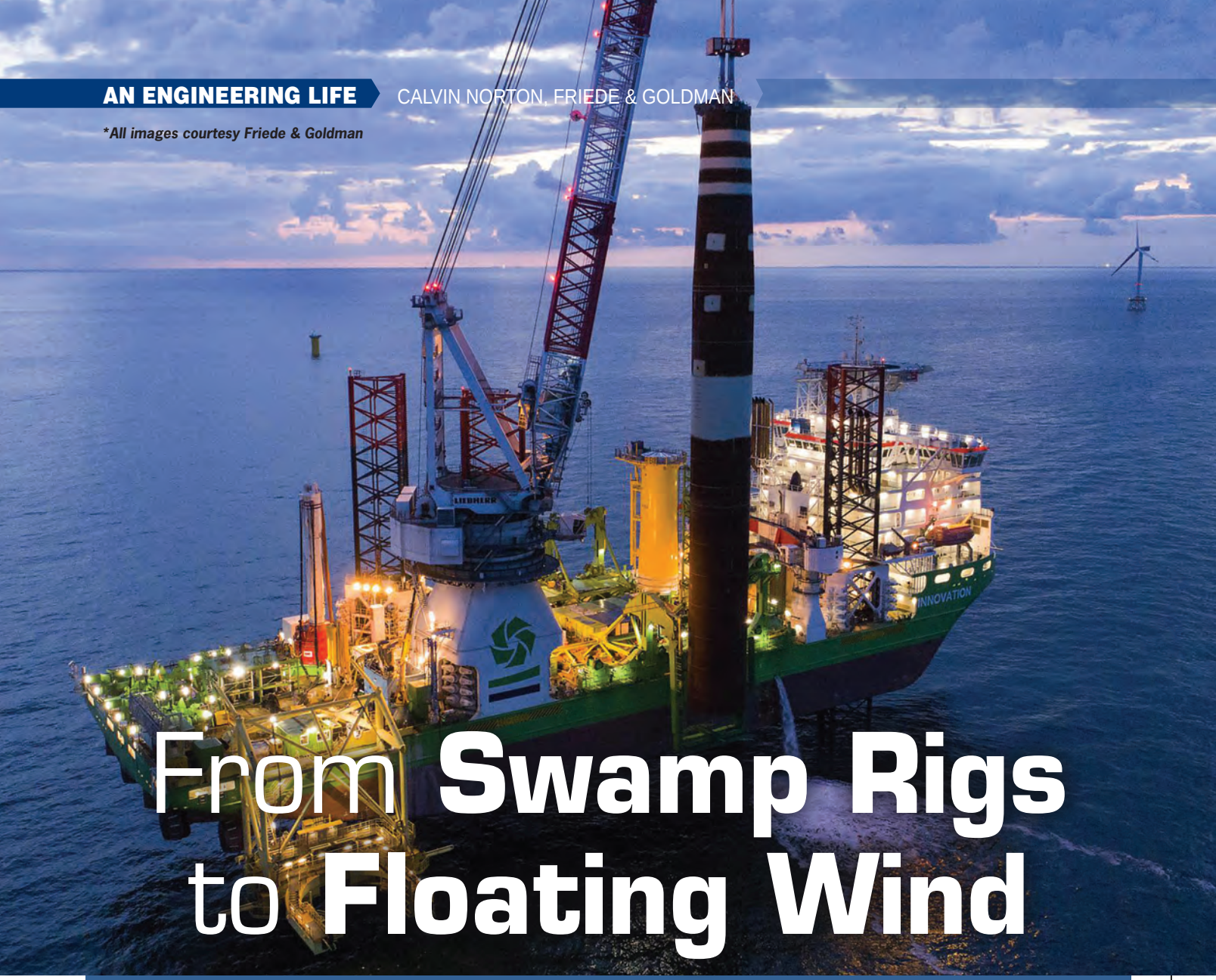
The ocean space is in constant flux and demands on stakeholders have never been higher.

While this may seem overwhelming to some, companies should embrace the change and learn to chart their own evolutionary pathway.

This requires familiarity with new technologies, careful planning, and collaboration throughout the supply chain, and with key external stakeholders. Crucially, the highest safety standards should always be maintained along the way.

This is a complex balancing act, and there are many obstacles to overcome. Nonetheless, the opportunities are enormous. As we approach the middle of the 21st century, companies which embrace the challenge, innovate, and evolve with the fast-moving ocean space will reap the benefits for years to come.

*All images courtesy Friede & Goldman



From Swamp Rigs to Floating Wind

Calvin Norton Reflects on 60 Years of Offshore Engineering

***Calvin Norton** spent 60 years with Friede & Goldman, with a career that spans and tracks some of the highest highs and lowest lows in the evolution of offshore energy production. As Norton retires and Friede & Goldman prepares to celebrate its 75th anniversary, **Offshore Engineer** recently spent some time with Norton to document the projects, the technologies and the people that have evolved over the past six decades.*

By Greg Trauthwein

When Calvin Norton joined Friede & Goldman in the early 1960s, the offshore industry was still in its adolescence. Floating drilling rigs were evolving, jack-ups were finding their legs — literally — and the Gulf of Mexico was the focal point of offshore activity. Over the next six decades, Norton would witness, and help shape, one of the most remarkable engineering evolutions in modern industrial history.

Now retired after 60 years with F&G — just shy of the company's own 75-year anniversary — Norton sat down with *Offshore Engineer* to reflect on a career that bridged swamp rigs and semisubmersibles, deepwater challenges and digital tools, and a new frontier in offshore wind energy.

BEGINNINGS IN THE BAYOU

Norton's maritime journey began in a small New Orleans-area shipyard building tugboats and barges. But it was a task involving the reactivation of a cold-stacked LST (Landing Ship Tank) turned tender-assisted rig that set his career on course.

"During the Coast Guard survey, it was found that the low-voltage cables didn't meet new regulations," Norton recalled. "I got the short straw and had to redesign the electrical system."

It was during this project that a visiting engineer — who had helped build the original drilling equipment — mentored Norton on the intricacies of offshore systems. "That lit the fire," he said. Not long after, Norton joined Friede & Goldman, where he would begin a legendary career in offshore design.

DESIGNING FOR AN EXPANDING INDUSTRY

One of Norton's first major projects at F&G was the SEDCO 135 series of semisubmersibles, soon followed by the now-iconic Pace Setter designs of the 1970s. "Every job was different," he said. "That's what kept me in it for so long."

A standout moment came in the early days of the Pace Setter project. A revision in ABS rules required a complete redesign of key connections in the bracing system — mid-build. Norton was dispatched to work directly with the shipyard team to ensure compliance without material waste.

"That project taught me the importance of thorough plan review and the value of being meticulous," Norton said. "It was then I really developed my approach to structural plan checks, which I carried through the rest of my career."

From semis to jack-ups — including the L780 series, Mod 2, Mod 5, and JU2000 variants — Norton's work helped define the hardware of deepwater exploration for decades.

THE DEEPWATER REVOLUTION

"Back when I started, 600 feet was considered deep," Norton noted. "Now it's 12,000 ft."

The push into deeper waters had a cascading effect on rig design, influencing everything from riser tensioning systems to mud circulation volumes, deck loads, and structural requirements. "It impacts everything the design team does—from structural engineering to naval architecture," he said.

One of the biggest challenges, Norton added, was balancing added capability with cost control. "As the rigs grew in complexity and size, so did the costs," he said. "It forced us to constantly look for smarter, more efficient ways to support the evolving equipment loads."

The SEDCO 135 series of semisubmersibles.

The JU2000 series

SAFETY AS A DESIGN IMPERATIVE

When asked about the most significant advances in offshore safety, Norton pointed to both personal experience and systemic change.

"One of the pivotal moments for the industry came in the early '60s with a gas explosion on a rig in the Gulf of Mexico," he recalled. The accident was caused by a lack of gas detection systems plus the fact that the areas that processed the returning mud was not segregated from the rest of the rig … it was one big open area.

"That accident prompted the Coast Guard to mandate that mud processing be confined to isolated compartments — no longer open well decks." From Norton's perspective, this was a particularly important accident and resultant rule making and engineering change as it was the beginning of the segregation of hazardous areas and inclusion of gas detection systems. Norton also cited automation on the drill floor and innovations in BOP handling systems as transformative. But perhaps most notable was the shift from slow hydraulic controls to the multiplex (MUX) electronic BOP systems. "Instead of relying on pilot hoses that slowed reaction time in deep water, MUX systems use electronic signals—effectively operating at the speed of light," Norton explained. "It made operations safer, especially when needing to disconnect quickly."

ENDURING THROUGH CYCLES

Having weathered six decades of boom-and-bust cycles, Norton emphasized the value of strategic downtime.

"During downturns, F&G used the time to develop new designs based on lessons learned from the last upcycle," he said. "You reflect on the equipment placement, process improvements, and anticipate regulatory changes. That way, when the market picks back up, you're ready."

His advice to young engineers entering the industry? "Learn every system. Understand how things connect and where improvements can be made. Those slow periods are your chance to grow and innovate."

OFFSHORE WIND: A NATURAL TRANSITION

In recent years, Friede & Goldman has brought its decades of jack-up and semi-sub experience to bear on offshore wind development.

"Our history in jack-up design made us a perfect fit for WTIVs [Wind Turbine Installation Vessels]," Norton explained. "We understood leg design, spud cans, jacking systems — all critical to the new generation of wind support vessels."

One of F&G's notable contributions is the barge rack (bar-drag) system, which allows wind turbine components to be transferred at sea, minimizing port calls and optimizing installation time. "It's about eliminating motion, increasing safety, and keeping the installation vessel focused on turbine work," Norton said.

F&G has also been studying floating wind platforms — applying its expertise in semi-submersibles to address new geotechnical challenges where seabed installation isn't feasible, such as seismic zones off the U.S. West Coast.

LOOKING AHEAD: FUELS, AI, AND FLOATING SOLUTIONS

As the offshore industry grapples with decarbonization mandates and efficiency pressures, Norton sees promise—but also challenges.

"Electrification of rigs has evolved from mechanical to SCR to variable frequency drives," he said. "Going further — like connecting rigs to shore power — is complex. You're dealing with long distances, high voltage, and safety concerns."

While hydrogen, methanol, and ammonia are on the horizon, Norton believes internal combustion engines — albeit cleaner versions — will remain the backbone of offshore energy for the foreseeable future.

Nuclear power barges? "Maybe," he said. "There are hurdles: safety, regulatory, and waste storage. And will ports allow them in? That's a big question."

Artificial intelligence and digital twins, however, are already proving their worth. "They're improving predictive maintenance and efficiency," Norton said. "Many OEMs now offer remote monitoring, which helps avoid failures before they happen."

A LEGACY OF PEOPLE AND INGENUITY

As he steps back from full-time work, Norton is proud of the people he worked with at F&G. "It's always been about solving problems — new or old," he said. "We've had some of the most technically savvy people in the business, from structure to electrical."

He's also adamant that new designs must keep coming. "You can't stand still. We've always tried to stay ahead of the competition with innovative solutions, and I think that spirit will continue."

Despite retiring, Norton hasn't gone far. "I still get emails and calls from the team," he said with a smile. "I'm always happy to lend a hand. After 60 years, it's like family."

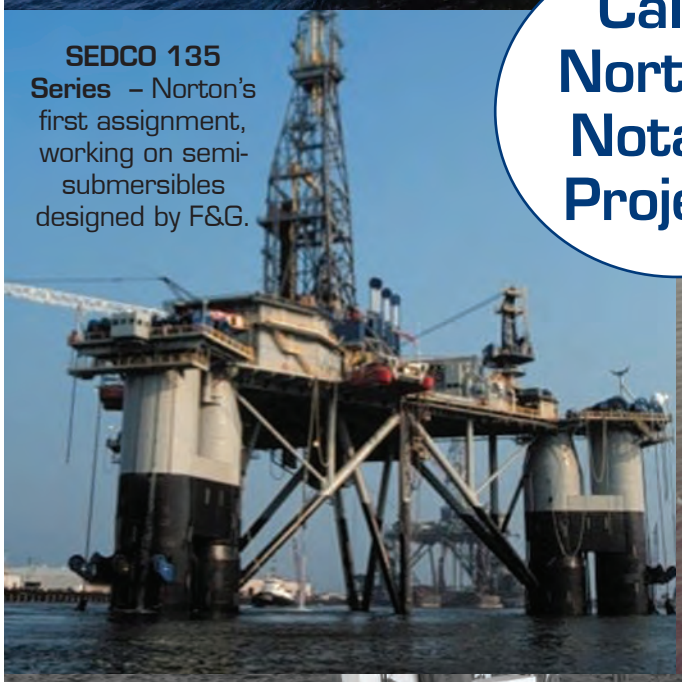
OETV

Watch the full interview with Calvin Norton, retired SVP who spent 60 years with Friede & Goldman, on Offshore Engineer TV:

WTIV Innovation (DEME) – Supported with spud can load spreaders and hard-bottom shock absorbers.

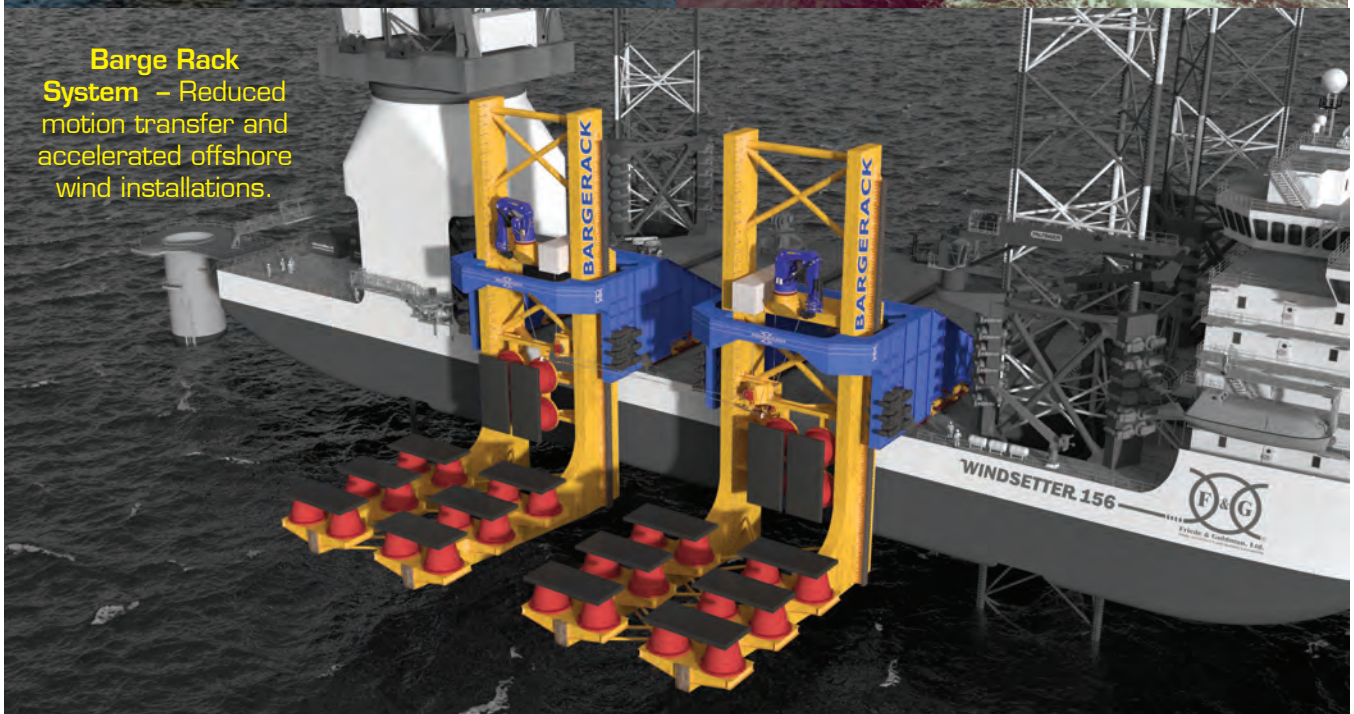
Calvin Norton's Notable Projects

SEDCO 135 Series – Norton's first assignment, working on semi-submersibles designed by F&G.



Pace Setter Series (1973) – Oversaw structural plan changes due to revised ABS rules, once construction had started.

Barge Rack System – Reduced motion transfer and accelerated offshore wind installations.



[METHANE] IS BLOWIN' IN THE WIND

Methane reporting standards for operators are tightening, increasing requirements for site-level detection and quantification.

By Wendy Laursen

Image courtesy Daniel Franklin Krause

A growing share of oil and gas production is subject to methane abatement commitments, thanks to new participants in the Global Methane Pledge (e.g. Azerbaijan), the Oil and Gas Decarbonization Charter (e.g. PetroChina) and the Oil and Gas Methane Partnership 2.0 (e.g. the Nigerian National Petroleum Company).

The voluntary Oil and Gas Methane Partnership 2.0 is the flagship oil and gas reporting and mitigation program of the United Nations Environment Program (UNEP) and now covers more than 42% of global oil and gas production.

Reporting advances from Level 1 through Level 5, with Level 4 reporting consisting of source level measurements and Level 5 consisting of two parts: site level measurements and reconciliation with the source level measurements from Level 4.

In April, responding to the continuous engagement with such schemes, Ipieca, the International Association of Oil & Gas Producers (IOGP), the Oil and Gas Climate Initiative (OGCI) and the Energy Institute released an update of their "Recommended practices for methane detection and quantification technologies – upstream" as well as an online tool to help operators select and deploy methane detection and quantification technologies.

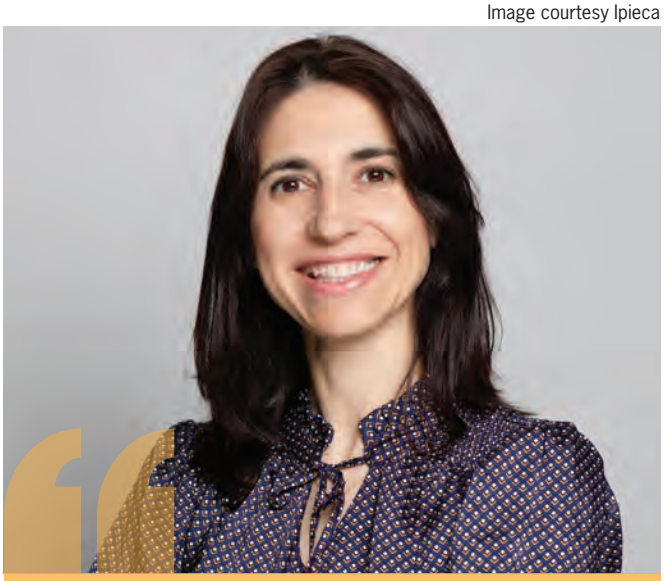
"Reporting standards for operators are tightening, increasing requirements for site-level detection and quantification technologies," says Julien Perez, Managing Director, OGCI. "At the same time, technologies to detect and quantify methane emissions are rapidly evolving."

The update includes six new technologies:

- **CI Systems:** Metcam (a fully integrated, stationary quantifying optical gas imaging (OGI) device)
- **Exploration Robotics Technologies:** Xplorobot Laser OGI (a handheld leak screening tool)
- **FLYLOGIX:** fixed wing drones for offshore specific measurements
- **Net Zero Aerial:** UAS Drone (a drone-based emission sensor)
- **Sierra Olympia Technologies:** LWIR OGI Camera Core (an optical gas imaging camera)
- **University of Calgary:** PoMELO (a truck-based measurement system).

Lorena Perez, Director for Climate and Energy at Ipieca, says there is no 'one-size-fits-all' combination of technologies for methane emissions detection and quantification. Key challenges include technical applicability, certification, access and deployment, validation and performance as well as data management and security.

Image courtesy Ipieca



There is no 'one-size-fits-all' combination of technologies for methane emissions detection and quantification.

– LORENA PEREZ,
DIRECTOR FOR CLIMATE AND ENERGY, IPIECA

Environmental conditions are also important. Cloud cover can affect the reflected sunlight that passive sensors use to detect methane, snow cover can impact reflectivity, affecting some laser-based technologies, and high winds can disperse methane making it harder for sensors to detect methane plumes. These environmental conditions are also critical to conducting successful measurement campaigns.

In January, SINTEF Research Engineer Daniel Franklin Krause released a technical memo summarizing the organization's approach to quantifying offshore methane emissions in support of OGMP 2.0 Level 5 reporting. SINTEF has used the measurement strategy twice on Gjøa (reporting year 2023 and 2024) and for Cygnus A (reporting year 2023). "We expect to do these measurements on five different platforms in 2025 (three for Vår Energi in Norway, one for Ithaca Energy in the UK, and one for a joint innovation project (JIP) supported by five different oil companies in the UK)," says Krause. "The JIP is being conducted to arrive at a standard way of doing this for

OEUK and will likely be used as an input for creating standards for IOGP. We are also in communication with other oil and gas companies in Australia and Brazil to help train their drone service providers with the approach we use."

Methane emissions from offshore platforms can be divided into four groups: flare post combustion plume, gas turbine exhaust, the degassed component of produced water after it exits the discharge caisson below the water surface and cold-vented and fugitive emissions. An FPSO or FSO will have additional methane emissions associated with the venting of tankers while crude oil and/or condensate is being loaded.

There's two predominant numerical strategies for measuring these emissions: dispersion modelling which can be used to predict the downwind concentrations of methane by calculating how a known quantity of it would spread out in the air when released. Using inverse dispersion modelling, one can work backwards by using downwind concentrations to calculate a release rate. The issue with this is that the various assumptions involved typical result with increased error, as there can be numerous sources of emissions and various wind vortices.

The other strategy involves using the flux method which aims to measure how much methane is emitted per unit of time and involves measurements independent from the source activity, explains Krause. The flux measurements should occur sufficiently downwind of the platform to be outside of the wind wake and main wind vortices that form on the downwind side of the platform.

More companies are moving to the flux method over dispersion modelling, he says, although there is quite a bit of variation in approach: different sensors with different detection levels and response times, flying transects at different distances and different approaches for measuring wind speed.

Both the windspeed and size of platform will affect how far the downwind wind wake will extend from the platform. Transects should largely bound the plume and allow for a re-creation of the general cross-sectional dimension of the plume. Flying these transects far enough downwind from the emission source will ensure they are outside of the wind wake so that a flux measurement can be made. As the plume is more diffuse, there will be more data points that can be measured in the plume. Flying too close means encountering the low pressure zone of the wind wake which will make it difficult to get enough measurements within the plume's cross-sectional area.

"Early on, many drone service providers were flying way too close in the wind wake where you get a higher concentration of methane and using dispersion modelling did not work well. Moving farther downwind (and outside of the wind wake) allows for a much better flux measurement," says Krause. This, however, does involve using a methane sensor that can easily detect and quantify methane emissions as low as 10 to 20 ppb. For this, Krause uses the ABB HoverGuard methane sensor.

Next for Krause is making these measurements easier by developing an autonomous drone platform. This would enable making these measurements without having to send drone pilots offshore. He has also finishing a technical memo on conducting leak detection and repair (LDAR) surveys in compliance with the new EU methane regulation using ppb-level methane sensors. He is developing it in partnership with Offshore Norge. Krause is also working with his SINTEF colleagues to take VOCSim global, an in-house VOC simulation tool based on nearly 40 years of measuring VOC emissions (inclusive of methane) while tankers have been loaded with crude oil. Measuring and reducing these emissions has largely been limited to Norway, but now this tool can be used to understand these methane emissions much better for use with reporting in OGMP 2.0 globally.

Image courtesy Ipieca

Image courtesy OGCI

Technologies to detect and quantify methane emissions are rapidly evolving.

– JULIEN PEREZ,
MANAGING DIRECTOR, OGCI

Image courtesy Daniel Franklin Krause

Early on, many drone service providers were flying way too close in the wind wake where you get a higher concentration of methane and using dispersion modelling did not work well.

– DANIEL FRANKLIN KRAUSE,
RESEARCH ENGINEER, SINTEF

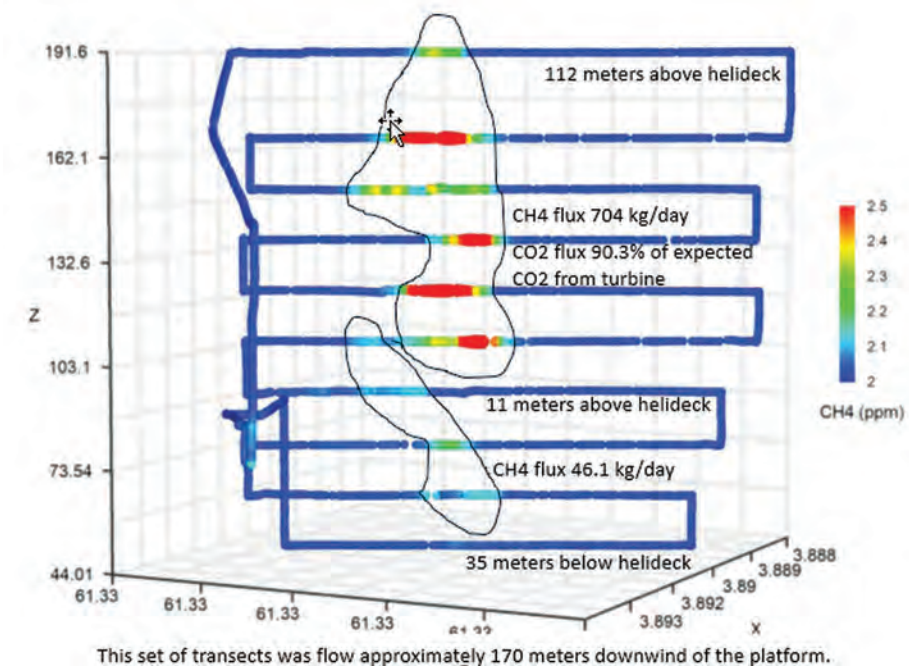


Image courtesy Daniel Franklin Krause

Downwind transect pattern with detected cross-sectional area of encountered plumes depicted. These transects were flown approximately 170 meters downwind of the platform. The flight pattern started from the helideck and then conducted the transects from low altitude to high altitude, pausing for approximately 5 seconds at the beginning and end of each transect to get static wind readings.

BIOFOULING CHALLENGES

Coatings protect offshore structures against corrosion, but the need for regular inspection means they must also be regularly cleaned, and there's no singular strategy for that.

By Wendy Laursen

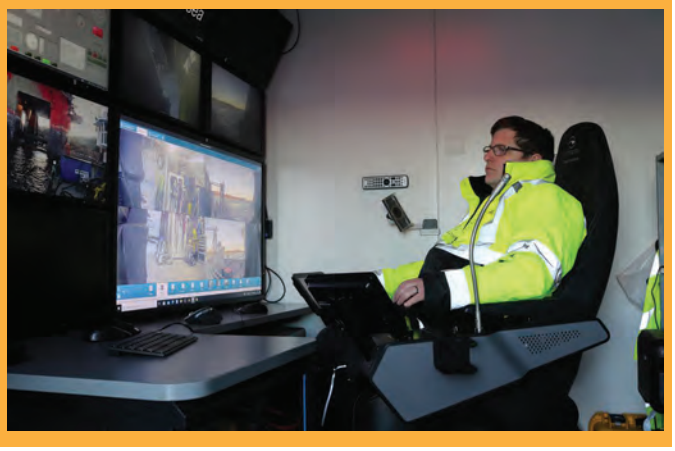
Image courtesy Seadrill/EcoSubsea

When Seadrill wanted to relocate the West Hercules from Norway to Canada, some 2,200 nautical miles away, biofouling was a concern for fuel efficiency and for the invasive species risk it posed. While in operation, the rig picked up seaweed and mussels that needed to be removed from its hull before moving the rig.

Kenneth Valen Ekløv, Marine Operations Manager at Seadrill, wanted to remove and dispose of the biofouling while the rig was quay side: efficiently and safely, without harming the local marine environment. He chose a robotic solution from ECOsubsea. "We did a pilot project with Hercules for ECOsubsea which was cost effective in this particular case, but divers are a more cost-effective choice in normal cases. The challenge was to be able to collect all the biofouling when released from the hull."

ECOSubsea's heavy-duty ROV solution was able to do the job – removing over 78 tonnes of marine growth.

Ekløv is seeing increasing attention being paid to the invasive species risks of biofouling, but finance is also a



ECOSubsea's heavy-duty ROV solution removed over 78 tonnes of fouling from the West Hurcules.

Images courtesy Seadrill

Images courtesy Hydrex

I've seen an FSO in Africa, which had been in the water for 13 or 14 years, and the ship's bottom was completely perforated from stem to stern."

– BOUD VAN ROMPAY,
FOUNDER AND CEO OF THE HYDREX GROUP

Diver cleaning biofouling

concern. "If we have significant amount of marine growth on our hull and thrusters, this will impact fuel usage during transit and in operations but may also, under extreme cases, impact the performance of the vessel."

The need for underwater inspections in lieu of dry docking (UWILD) drives biofouling management for static assets such as FPSOs. Mark Barnbrook, Technology Manager for FPSOs at SBM Offshore, says typically bands of conventional TBT-free self-polishing or polymer coatings are used on the hull. For sea chests, a silicone coating is used. "These are easy to clean, but very easily damaged, so they are not applied on the shell," he says.

Inspections are typically done on fixed schedules of 2.5 or five years for FPSO conversions, but the company is moving towards risk-based inspections for its newbuild FPSOs. "Quite often we use high pressure water jets to remove biofilm," Barnbrook says. "If you're too severe with cleaning tools, then you start to damage the coating and risk corrosion."

The root cause of corrosion is the use of coatings which are porous and fragile, says Boud Van Rompay, Founder and CEO of the Hydrex Group. "I've seen an FSO in Africa, which had been in the water for 13 or 14 years, and the ship's bottom was completely perforated from stem to stern, straight through. And that was a 25-millimeter plate."

Epoxy (polymer) coatings are very porous, he says. "That lets the water through, but also creates an opening for the secretions of the animal fouling. Their glues are very tenacious and they penetrate. They're designed to penetrate because how do you cling to a rock?" This hard fouling cannot be removed without causing further damage to the coating, exposing more steel to corrosion. It is a vicious circle, he says. Van Rompay has found that impermeability can be achieved with a thick, glass-platelet reinforced vinyl ester coating.

The floating offshore wind industry faces some unique challenges. The diameter of mooring lines and dynamic cables are substantially smaller than those used in the oil and gas industry. Dr. Stefania De Gregorio – Principal Marine Ecologist at Fugro, says biofouling can cause fatigue life reduction, as it increases the effective mass of a structure

Image courtesy Fugro

Marine growth cleaning campaigns are critical to our clients. They are often classified as priority 1 tasks when part of a larger campaign or scope, as they can uncover significant defects with their assets."

– DR. STEFANIA DE GREGORIO,
PRINCIPAL MARINE ECOLOGIST, FUGRO

Image courtesy PPG

Offshore wind platforms are typically uncrewed and remote, severely limiting the ability to perform regular inspections and maintenance."

– ERIC KING,
PPG GLOBAL SEGMENT MANAGER, POWER & MINING, PROTECTIVE AND MARINE COATINGS

without any significant change in stiffness, and hydrodynamic drag can be pushed beyond the original engineering design. Biofouling may also accelerate structure corrosion by creating oxygen depleted zones which then result in anodic sites by blocking compressed current distribution.

For cables on the seabed, biofouling may act as an added layer of insulation that prevents the cable from dissipating heat effectively. This creates a risk of overheating. Biofouling also affects multibeam and sonar surveys by signal attenuation and false bottom detection, says De Gregorio. Biofouling obscures a structure's true dimensions in multibeam echosounder data and creates data gaps through shadowing effects.

"Marine growth cleaning campaigns are critical to our clients," she says. "They are often classified as priority 1 tasks when part of a larger campaign or scope, as they can uncover significant defects with their assets." Having robust, site-specific data on the engineering effects of biofouling on submerged assets will allow action suited to the particular environment, she says.

Eric King, PPG Global Segment Manager, Power & Mining, Protective and Marine Coatings, contrasts offshore wind turbines with oil and gas platforms: "Offshore wind platforms are typically uncrewed and remote, severely limiting the ability to perform regular inspections and maintenance. This geographic and logistical isolation magnifies the impact of biofouling, as accumulation can go undetected and unaddressed for extended periods."

And wind turbines are expected to operate for 35 years or more, much longer than the 25-year durability typically validated under current standards like NORSOK M-501 and ISO 12944-9. Operators therefore select advanced protective coatings for their performance across multiple stress factors including abrasion, corrosion, seawater immersion and mechanical impact.

"The splash zone is one of the most critical areas for

"The splash zone is one of the most critical areas for offshore assets due to its complexity with fluctuating seawater levels and continuous exposure to seawater."

– SCOTT KIM,
GLOBAL SOLUTIONS MANAGER FOR WIND ENERGY, JOTUN PERFORMANCE COATINGS

Coatings used in the splash zone must possess mechanical resistance properties that can withstand constant wave action and floating debris.

Images courtesy of Jotun

offshore assets due to its complexity with fluctuating seawater levels and continuous exposure to seawater," says Scott Kim, Global Solutions Manager for Wind Energy, Jotun Performance Coatings. This exposure can compromise the integrity of both offshore oil and gas rigs and wind farms. Coatings used in the splash zone must possess mechanical resistance properties that can withstand constant wave action and floating debris, as well as natural disasters like typhoons.

"Cleaning in the splash zone is not a priority, as the focus is to equip assets with the right coatings to avoid corrosion – meaning less maintenance," says Kim. "This is a proactive approach, which is proven over many years." He cites as an example case where DNV inspected sections of jacket from a North Sea oil platform which was installed in 1972 and decommissioned in 2020. Jotun's coating was applied to the platform in the late 1980s and, despite over 30 years' exposure to the North Sea's harsh environment, it was intact, still smooth and showing no signs of delamination.

If you don't have an asset that can last for a long, long time without maintenance, it is not really that sustainable, says Kim. "It is estimated that steel production is responsible for as much as 9% of global emissions, around 3.5 billion tons of CO2 every year, so we are talking about a massive impact by just taking care of these assets."

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FLOATING WIN

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All images courtesy Gazelle Wind Power

D PUSH:

PORTUNITY EUROPE

Coatings protect offshore structures against corrosion, but the need for regular inspection means they must also be regularly cleaned, and there's no singular strategy for that.

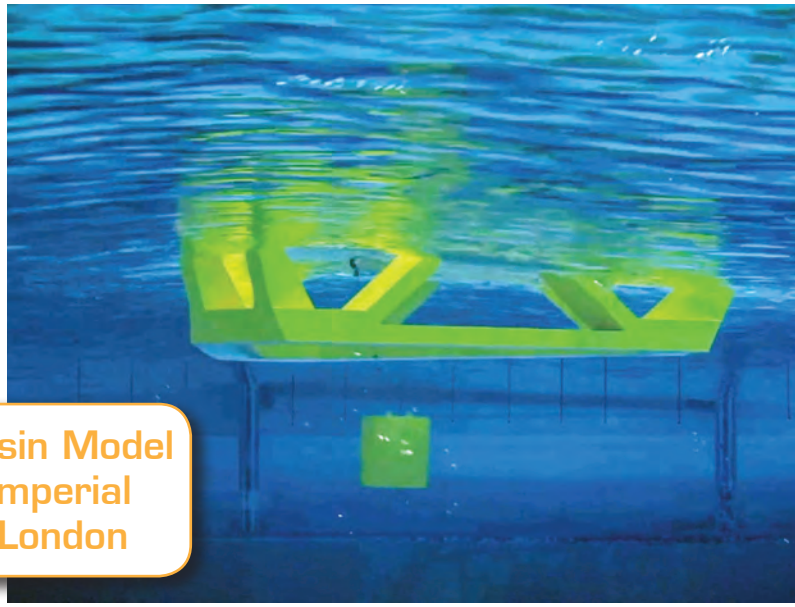
By Jon Salazar, Founder and CEO of Gazelle Wind Power

We are entering a new era—one where energy sovereignty, not just sustainability or cost, shapes investment and policy decisions. In this environment, nations are prioritizing local, resilient energy generation over imported or intermittent alternatives. Portugal, with its unique blend of geography, industrial capability, and political will, is positioning itself at the heart of this shift. This article outlines how floating offshore wind can help the country meet its decarbonization targets while strengthening energy security and advancing economic opportunity.

In recent months, Portugal has stepped up its efforts to harness offshore wind, particularly floating offshore wind technology. With its favorable natural conditions, active industrial base, and progressive energy policies, the country is fast becoming a leading destination for investments in wind energy—even amid ongoing political volatility.

Floating offshore wind, which allows turbines to operate in deeper waters where fixed-bottom foundations are not feasible, represents an ambitious leap forward. Unlike fixed-bottom turbines anchored to the seabed, floating turbines rely on buoyant structures tethered by advanced mooring systems and anchors. Portugal's expansive Atlantic coastline offers some of the best conditions in the world for this technology.

The Gazelle team and a stack of blades in Port of Viana do Castelo.



Gazelle Basin Model test @ Imperial College London

These assets present an opportunity not just for decarbonization, but for rethinking how Europe secures its energy. Portugal's strategic ambitions align with global trends, with floating wind capacity projected to reach 300 GW worldwide by 2050, according to the Global Wind Energy Council (GWEC). The country has set a 2 GW target for 2030, aiming to expand to 10 GW by 2040. Government statistics underscore Portugal's renewable progress. In 2023, wind became the largest source of renewable electricity, supplying 29% of the country's energy. Renewables overall contributed 71% of total electricity generation, peaking at over 80% in December 2023. The government is targeting 51% renewables by 2030—an increasingly attainable goal.

This commitment goes beyond climate leadership. By boosting its renewable share, Portugal reduces reliance on fossil fuel imports, strengthens its position in the EU's energy transition, and builds resilience against geopolitical and market volatility.

Geography, Technology, and Industrial Strength

Portugal's Atlantic coast, with 1,794 kilometres of shoreline, offers deep waters and consistent offshore wind speeds of 7–10 m/s—ideal for floating turbines. Moderate wave conditions and low seismic activity add to its suitability.

These natural conditions support both deployment and innovation. Gazelle Wind Power's floating platform and dynamic mooring system technology are specifically designed for these conditions—ensuring stability, modularity, and performance in a high-energy maritime environment.

Portugal also offers industrial proximity to Europe's major energy markets. Floating wind farms can directly connect into the continental grid, positioning Portugal as a natural energy exporter within the EU. This geographic advantage is equally compelling for global investors seeking to align their strategies with Europe's long-term energy goals.

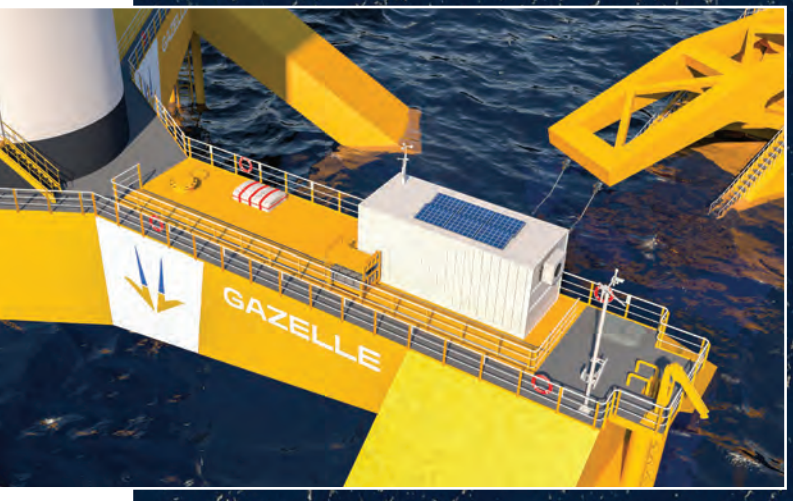
A Policy Framework in Flux, Yet Moving Forward

In November 2023, Portugal launched the first phase of a 3.5 GW offshore wind auction, focused largely on floating wind. This auction structure includes Contracts for Difference (CfDs) to provide stable revenues and attract investment. These financial tools reduce market risk and unlock capital for innovation.

Yet these developments take place amid recurring political turbulence. Portugal has now experienced three government collapses in as many years, creating uncertainty around policy continuity. However, the country has consistently shown a commitment to honouring existing frameworks and supporting strategic sectors like renewables—even during caretaker administrations.

Further reinforcing its innovation agenda are the Technological Free Zones (TFZs), which streamline permitting and provide fiscal incentives for testing new floating wind systems. TFZs give developers the ability to prototype and industrialize innovations faster, accelerating progress from lab to market.


GAZEL


GAZELLE

Ports, Supply Chains, and Workforce

Portugal's ports—such as Setúbal and Viana do Castelo—have the potential to serve as industrial hubs for the assembly and logistics of floating platforms. These sites benefit from Portugal's legacy in shipbuilding and marine engineering, offering a skilled workforce, modular fabrication capabilities, and easy access to the Atlantic.

However, as seen across Europe, critical infrastructure gaps remain one of the major bottlenecks for floating wind deployment. While Portugal has the infrastructure to support smaller projects, to reach scale, projects will require significant port upgrades, including heavy-lift capacity, laydown space, and grid connectivity.

Furthermore, supply chain uncertainty is delaying investment in component manufacturing and facility upgrades. This contributes to long lead-times for turbines, substations, and other critical infrastructure. Without stronger demand signals and coordinated policy action, this supply chain inertia could threaten the timely delivery of national renewable targets.

Financing the Future

Despite growing momentum, floating wind is entering a more selective financial environment. A broader capital crunch in the offshore wind sector—driven by project impairments and investor pullouts—has raised the cost of capital. Investors are shifting toward lower-risk markets and proven technologies, making it more difficult for innovative floating wind projects to secure funding.

One key factor increasingly shaping the pace of deployment is the cost of financing. As interest rates remain high and macroeconomic uncertainty looms, insurance premiums – especially for novel technologies operating in harsh offshore environments – are becoming a major component of project risk profiles. This in turn raises the cost of capital, making innovation not only a technical but also a financial issue, and a key driver of capital.

Strategic Takeaways for Portugal and Beyond

To move from promise to performance, Portugal and its peers must act decisively:

- Policy certainty must match ambition. Announced targets need follow-through with timely auctions and clear permitting pathways.
- Infrastructure investment must precede project investment. Grid and port upgrades are part of the critical path and must be de-risked early.
- Industrialisation is essential. Supply chains need visibility and volume guarantees to justify expansion.
- Credibility attracts capital. Financing will flow to projects that combine technical readiness, political alignment, and predictable economics.

Portugal offers a unique opportunity to demonstrate that innovation—particularly in floating platform design, mooring systems, and system integration—can unlock the scale, cost reduction, and energy resilience needed for this next phase of offshore wind. For Gazelle Wind Power it's about pioneering the solutions that can make floating wind affordable and viable at industrial scale.

Portugal's success will depend not just on its natural resources, but on its ability to turn targets into timelines, and policy into projects. If the country continues to align infrastructure, supply chain, and financing tools behind its floating wind ambition, it will be well-positioned to emerge as a European leader in this vital sector.

All images courtesy Xenos Marine

REVIVING A HEAVY-LIFT GIANT:

XENOS MARINE'S T IS READY FOR

TX-10000 DUTY

By Greg Trauthwein

One of the most powerful heavy-lift vessels ever built is entering a new chapter under U.S. ownership, reconditioned for major offshore work in the Gulf of America. Renamed the TX-10000, this twin-gantry catamaran is at the center of Xenos Marine's mission to expand domestic heavy-lift and decommissioning capabilities, following a major refit at Gulf Copper Ship Repair.

The TX-10000, previously known as the VB-10000, has a storied history.

Originally commissioned in 2010 by Versabar as a next-generation evolution of the pioneering Bottom Feeder, the vessel was purpose-built for offshore decommissioning and salvage in the aftermath of destructive Gulf hurricanes. With a lifting capacity of 10,000 tons (limited in practice to 7,500 tons due to buoyancy), dynamic positioning to DP3 standards, and towering hook height of nearly 200 feet, the TX-10000 quickly became a unique asset in U.S. waters.

Now, under the new banner of Xenos Marine — a partnership between longtime marine heavy-lift specialist Matt Fish and T&T Salvage's Kevin Teichman— the vessel is poised to play a key role in Gulf of Mexico operations once again.

A FULL-CIRCLE MOMENT

For Matt Fish, Managing Director of Xenos Marine, the relaunch of the TX-10,000 represents both a personal and professional milestone. Fish began his offshore career with Versabar during the development of the Bottom Feeder, later managing operations for the VB-10000 through years of decommissioning and salvage campaigns. One of the most notable was the removal of the Golden Ray car carrier from the St. Simons Sound in Georgia—a complex project that required slicing the 700-ft. shipwreck into eight sections weighing up to 8,000 tons, using massive mooring chains as cutting tools.

That collaboration between Versabar and T&T Salvage laid the groundwork for the current partnership. When the opportunity arose to acquire the vessel from its interim owner, Fish and Teichman joined forces to launch Xenos Marine, with a mission to restore the TX-10000 to full operating strength and reintroduce it to the U.S. offshore market.

MARITIME REPORTER TV Watch the full interview with Matt Fish @

OVERHAUL @ GULF COPPER

One of the first moves under new ownership was to begin an extensive overhaul at Gulf Copper Ship Repair in Galveston, Texas. The vessel, now 15 years old, was overdue for its mandatory five-year special survey, and Xenos Marine acted quickly to secure drydock space and initiate repairs.

Gulf Copper handled steel and hull work, blasting and coating, and installed cathodic protection. Meanwhile, Xenos Marine launched a parallel refurbishment campaign that extended to nearly every critical system aboard.

The TX-10000's eight 1,000-hp thrusters—four on each barge—were pulled, inspected, and reconditioned. Hoses and electrical components were replaced. A complete re-rigging of the crane blocks is also underway, with new wire shipped in from South Korea: four 3.5-inch main hoist wires (7,500 feet each) and four 2-inch auxiliary wires (5,000 feet each). These cables support four primary 2,000-ton capacity crane blocks and four 500-ton auxiliaries, giving the vessel exceptional versatility for lifting topsides, jackets, or wrecks.

Once the wiring is installed, the TX-10,000 will undergo a full load test and sea trial series, including functional failure mode effects analysis (FMEA) to validate offshore readiness.

READY FOR WORK

Xenos Marine has already secured a long-term contract with a major Gulf operator, with work expected to begin as early as June. Initial tasks will focus on platform decommissioning, including topside removals and jacket reefing operations. The goal, says Fish, is to keep the TX-10000 working close to home—primarily in U.S. waters—to serve domestic decommissioning and salvage markets.

Beyond the vessel itself, Xenos Marine brings a broad portfolio of supporting assets to the table. Under the combined Xenos and T&T umbrella, the company operates small deck barges, supply and crew boats, and has engineering, diving, and survey capabilities in-house. Plans are underway to potentially add a mid-size crane barge to support increased demand.

A CREW REUNITED

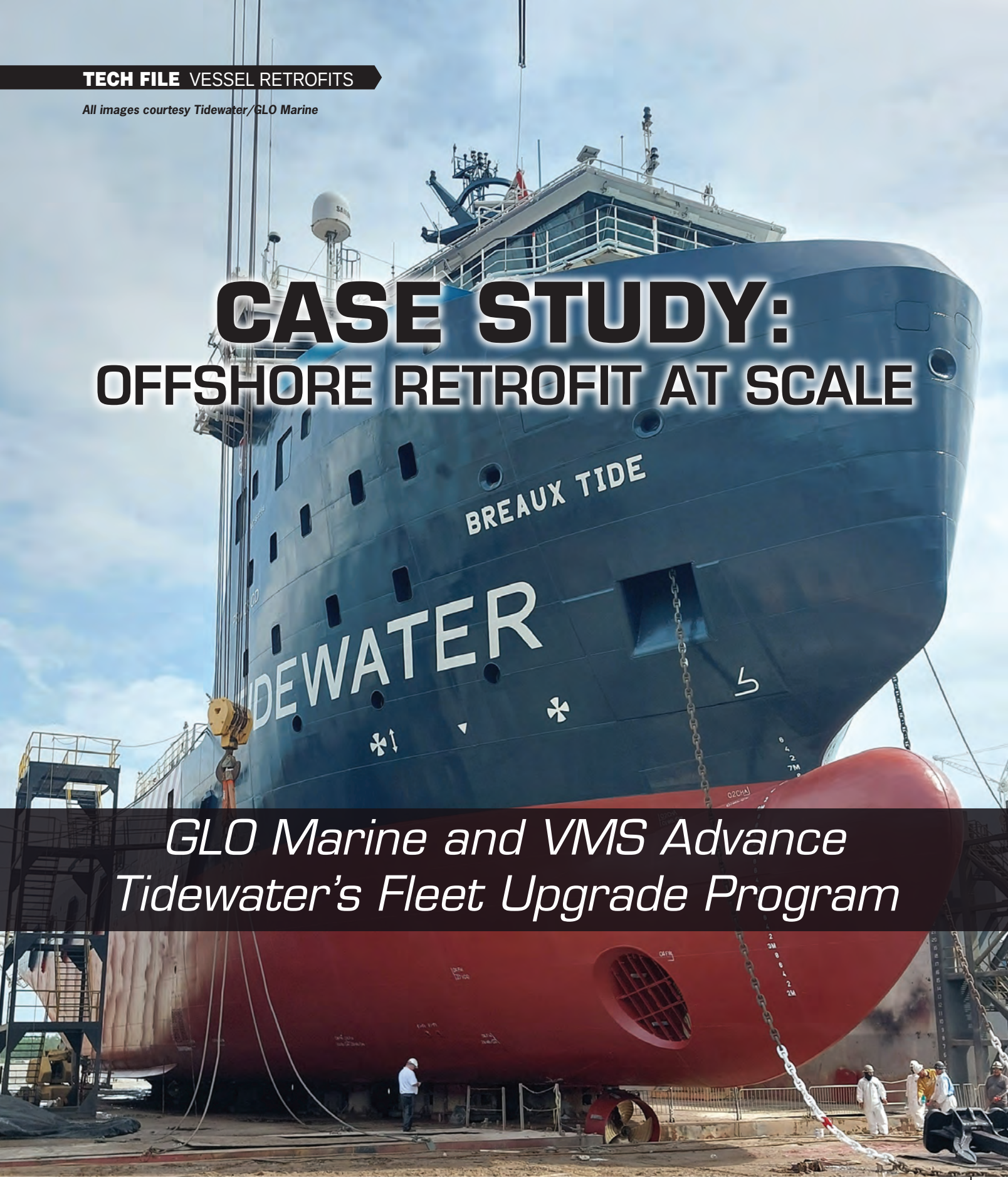
One of the most remarkable elements of the vessel's rebirth is the reunion of its original crew. Many of the mariners and technicians who worked on both the Bottom Feeder and the VB-10000 have returned to Xenos Marine, reassembling a team with nearly two decades of shared experience.

That continuity, combined with the vessel's unmatched lifting ability and the deep technical bench provided by the T&T Salvage partnership, puts Xenos Marine in a prime position to support America's growing backlog of offshore infrastructure removal projects.

As the Gulf Coast prepares for an uptick in decommissioning activity, the TX-10000 stands ready once more—rebuilt, reflagged, and recommitted to serving U.S. waters.

All images courtesy Tidewater/GLO Marine

CASE STUDY: OFFSHORE RETROFIT AT SCALE



GLO Marine and VMS Advance Tidewater's Fleet Upgrade Program

GLO Marine and VMS Group Denmark are expanding their role in the offshore energy sector through a multi-vessel retrofit program for Tidewater, the world's largest offshore support vessel operator. The partnership builds on a proven track record of delivering complex upgrades efficiently and at scale.

Covering 16 vessels across three continents—including several in U.S. waters—the program marks an important step in both companies' strategy to provide fleet-scale retrofit solutions to the international offshore vessels market. It highlights their capability to manage multi-region logistics, compliance, and client requirements.

GLO Marine and VMS Group combine deep engineering expertise, turnkey project control, and global delivery capacity—meeting the industry's growing demand for upgrades done efficiently and with minimum impact on operations.

"By approaching this as a multi-vessel program rather than managing each vessel individually, we have successfully reduced engineering hours by 25% and materials and logistics costs by 15% per vessel. This achievement was made possible through the development of a plug-and-play system, which not only accelerates retrofit execution but also ensures cost reductions while maintaining the expected quality standards. Such impactful results are attainable only through well-aligned and collaborative efforts." said Alin Pohilca, Operations Director at GLO Marine. "This program is a clear example of what we bring to the table: high-volume coordination, technical precision, and hands-on execution at scale. We are fully equipped to support offshore vessel operators globally with retrofit and upgrade programs that demand both engineering proficiency and speed."

Project Progress

GLO Marine and VMS Group are executing a full-scope BWTS retrofit and lifecycle project management plan for 16 Tidewater vessels. To date, starting December 2024, the teams have delivered 16 BWTS systems, surveyed 14 vessels, delivered 12 engineering packages approved by class, completed prefabrication and materials procurement for 5, and successfully retrofitted and commissioned 2—with over 50 professionals involved across the U.S., Africa, and Europe. The work is being delivered through a fully integrated EPCI model, with GLO Marine managing engineering, prefabrication, logistics, and installation. This approach ensures full control and benefits the client, which deals with only one point of contact throughout the project.

Together, GLO Marine and VMS Group deliver comprehensive retrofit solutions for the offshore energy sector. VMS brings deep experience in propulsion systems, engine overhauls, and global field support, while GLO Marine contributes class-approved engineering, procurement coordination, and turnkey execution. Their combined strengths allow for highly integrated services, optimized for the operational realities of offshore fleet upgrades.

"In today's offshore energy landscape, no single company can tackle complexity alone. The ever more difficult challenges demand cross-border collaboration and a shared vision. Strategic partnerships like ours enable engineering, equipment, and service teams to act as one—delivering scalable, efficient, and future-ready solutions," said Palle Andersen, Engineering Manager at VMS Group.

Vissim's Monitoring System to Enhance Safety of Qatar's Offshore Assets

Norwegian technology company Vissim has signed a contract to deliver its Centralized Vessel Monitoring and Alerting System (CVMAS) to Qatar, designed to enhance safety and security for offshore assets.

CVMAS improves efficiency in vessel logistics and contributes towards reduced CO2 emissions and increased maritime situational awareness

The system will provide comprehensive monitoring and alerting capabilities, covering Qatar's coastline and more than 300 offshore assets.

The core of Vissim's technology is a specially designed software platform which, through input from millions of data points, provides situational awareness of the geographical area and increases understanding of maritime safety, security, and efficiency.

In Qatar, Vissim's CVMAS integrates various data sources, including the automatic vessel identification system (AIS), weather data from platforms like Storm and Vaisala, and radar technology, to provide a detailed maritime overview.

Additionally, CVMAS integrates with maritime tools and platforms, including personnel and logistics management systems such as SkyTrac and DaWinci, and geographic mapping tools like ArcGIS. This integration also includes monitoring helicopter traffic and personnel onboard offshore assets, further enhancing operational safety and efficiency.

Vissim is delivering the system as a subcontractor to Qatar-based Bin Omran Trading & Telecommunications, which oversees local project management and offshore installation.

DMO Safety Tech to Continue Serving North Sea Oil and Gas Operator

Safety technology provider Dräger Marine & Offshore (DMO) will provide its portable gas detection and breathing apparatus systems to a major North Sea oil and gas operator as part of the long-term contract extension.

Due to run for five-years, with a further two one-year extension options, the extension of the existing supply contract means more than 10 U.K. North Sea assets will continue to benefit from Dräger's portable gas detection and breathing apparatus systems.

Dräger offers a wide portfolio of respiratory protective equipment from light respiratory masks, powered-air purifying respirators and airline systems, to heavy respiratory protection, such as breathing apparatuses. For monitoring the respiratory protection of emergency and rescue teams, boards and telemetry systems are also made available.

As for the handheld gas detectors, the company's portfolio includes single-gas and multi-gas detectors, gas detector tubes as well as calibration and bump testing equipment and software packages.

"Health and safety should be of the upmost importance to any business, whether that be in offshore oil and gas or otherwise, and by engaging DMO's services for a minimum of five-years the operator is underscoring its long-term commitment to upholding the sector's high standards," said Lawrie Kerr, UK Sales Manager, Dräger Marine and Offshore.

Synaptec's GreenLight Set to Tackle High-Voltage Cable Faults

Scottish firm Synaptec has launched Greenlight, a

monitoring solution designed specifically to address high-voltage cable failures, stemming from faults in cable joints and terminations.

Greenlight provides continuous, automated visibility of all joints and terminations in a cable network, delivering early warnings of emerging faults before they become failures.

Designed for offshore wind farms and high-voltage power grids, it replaces manual inspection and reactive maintenance with a smarter, safer, and far more cost-effective approach to asset management.

The system is based on Synaptec's patented Distributed Electrical Sensing (DES) technology, which uses fully passive sensors that require no power supply, no data networks, and no ongoing maintenance.

These sensors are easily retrofitted or embedded into cable joints and terminations at many locations over distances of up to 60 km from a substation.

Light from each sensor is sent via standard optical fibre to a central interrogator located at the substation. From there, Synaptec's real-time analytics platform, Synthesis, processes

the data, highlights anomalies, and delivers actionable insights through automated alerts and a visual dashboard.

With Greenlight in place, operators can identify and localize early signs of degradation, such as abnormal electrical currents, thermal stress, or evolving phase-to-screen ratios, at the exact location of the joint or termination at risk.

Rather than waiting for failure, maintenance teams can intervene precisely where needed and at the right time. Maintenance becomes targeted and efficient, and costly downtime is avoided.

The first commercial Greenlight installations have already been deployed with offshore wind operators and transmission systems internationally. There are plans for further large-scale installations throughout 2025.

Salunda's Latch Monitoring Tool Bolster Safety of Pipe Handling on Drilling Rigs

Salunda, a provider of digitized solutions for safety critical industries, has launched the Latch Hawk 2 fingerboard latch monitoring device to improve safety during pipe handling on offshore drilling rigs.

Latch Hawk 2 provides a direct measurement of fingerboard latch status in real-time to prevent fingerboard DROPS incidents, eliminating the need for a spotter or camera.

Second generation improvements to the patented wireless monitoring device include new sensor technology with better shock and vibration resistance, a more robust design, cloud-based digital condition monitoring, and greater than seven-year battery life, which extends on the previous iteration by over two years.

The system integrates with all major OEM drilling control systems (including DrillView, Cyberbase, and Amphion) and can be installed using a patented ratcheting mechanism, adding an extra layer of protection against DROPS incidents for legacy fingerboards.

Improvement in the retrofittable design means there is no operational downtime during Latch Hawk 2 installation.

Latch Hawk works by using wireless sensors to determine the status of a latch. This data is then compared to the command status of the latch sent from the drilling control system. If an inconsistency is flagged by the system, an alert

will be triggered within the control system HMI and a pipe racker interlock will be engaged preventing the chance of dropped pipe or other major failures. The system is IECEX, ATEX and INMETRO certified for use in Zone 2.

Latch Hawk is already deployed on dozens of rigs globally, with the new device now shipping as standard.

DrillDocs' AI-Enabled Computer Vision Tech to Ensure Wellbore Stability

Digital shale shaker surveillance technology DrillDocs, together with Aker BP, has employed its AI-enabled computer vision technology to automatically detect cavings on the Norwegian continental shelf (NCS) for the first time.

DrillDocs' CleanSight technology was deployed on the Noble Integrator rig while drilling in the Fenris field on the Norwegian Continental Shelf. At the time of the achievement, twelve sections had been monitored, totaling over 13,000 meters, including 16½-inch, 12¼-inch and 8½-inch sections.

The CleanSight system uses high-specification Axis Communications cameras designed for hazardous environments.

The technology features on-board processing capability for real-time image analysis. DrillDocs' patented and proprietary image-processing algorithms continuously monitor material as it exits the rig's shale shakers.

This capability allows the technology to calculate the amount, shape, and size of solids being recovered.

The data provided by CleanSight is said to enable better and faster decision making that can lead to enhanced drilling performance, borehole stability, and solids control operations.

Prior to the introduction of DrillDocs' technology, shale shakers were only monitored on a periodic basis by drilling rig staff making visual inspections.

This meant that sporadic cavings, which offer an early warning of potential borehole instability, were frequently missed. By the time crews realized that the borehole was becoming unstable, the risk of a pack-off event - which often leads to the drill string becoming stuck in the hole - was already elevated.

The new approach allows the drilling crew to react in near-real-time to events happening in the wellbore, significantly reducing the risk of pack-off and the non-productive time and costs incurred when recovering from stuck pipe events.

BV's AI-powered Augmented Surveyor 3D

Bureau Veritas Marine & Offshore (BV) has introduced its latest digital innovation, the Augmented Surveyor 3D (AGS 3D), a cutting-edge inspection tool leveraging artificial intelligence and machine learning to detect and localize structural anomalies on ships and offshore assets.

The new solution was piloted successfully on a TotalEnergies-operated FPSO in West Africa. During the trial, drones captured extensive image and LiDAR data from two ballast tanks, which AGS 3D used to build a detailed 3D model, complete with AI-enhanced corrosion mapping. Following this success, TotalEnergies plans to extend AGS 3D to additional offshore assets.

AGS 3D streamlines inspection workflows by automating anomaly detection, defect localization, and corrosion analysis within a unified digital environment. By reducing human entry into confined spaces and expediting data pro-

cessing, the solution improves both safety and efficiency across a range of marine sectors, including FPSOs, FSOs, floating wind platforms, and in-service ships.

The AGS 3D tool includes drone-based LiDAR scanning, AI-powered image analysis, automatic 3D defect localization, and a collaborative inspection platform—further enhancing the role of digital tools in maritime classification and survey activities.

Halliburton's EcoStar Electric Safety Valve

Halliburton has launched the new EcoStar electric tubing-retrievable safety valve (eTRSV), a second-generation product that eliminates hydraulic actuation from safety valve systems.

The EcoStar eTRSV acts as a fail-safe that closes in case of well incidents at the surface to safeguard personnel and the environment.

Halliburton's deep water DepthStar tubing-retrievable safety valve technology forms the foundation of the EcoStar eTRSV, which incorporates field-proven magnetic coupling technology and replaces the hydraulic actuation system with electric actuation.

This design increases reliability by isolating the actuation system from the completion tubing fluid and pressure.

It features independent and redundant electro-mechanical actuation and control systems, which enable more precise control, real-time position sensing, and valve health monitoring at the surface.

The innovation reduces the need for extensive surface facilities, streamlining operations, and enhancing personnel safety and field economics.

Viking's Immersion Suit Designed for Women

Viking Life-Saving Equipment has launched the first Crew Transfer Vessel (CTV) immersion suit in the world designed for women working in offshore wind energy, using guidance on diversity and inclusivity from industry leaders Ørsted, Siemens and Vestas.

The VIKING YouSafe Cyclone suit joins a growing portfolio of VIKING PPE whose fit and features reflect the safety needs of female seafarers, pilots and technicians in the marine and offshore industries.

In UK waters, and elsewhere, getting the right PPE in place to best serve the safety needs of women offshore has become a focus for equity and inclusivity strategy at Ørsted, Siemens and Vestas.

Delivered in high-vis GORE-TEX NARVIK, the female-fit YouSafe Cyclone suit is approved to the same dual SOLAS/MED and CE/ISO standard as the male version and is available in multiple sizes.

Common features include compatibility with all standard offshore harnesses, durable Neoprene cuffs and neck seal, retro-reflective piping for increased visibility in dark surroundings, and a maintenance free zipper.

"Ørsted has identified female-specific PPE as part of the critical infrastructure we need for women to work safely offshore today and a necessity to attract more of them into this industry. We were delighted to work with VIKING as one of our key safety solution providers to take a significant step in the right direction," said Lasse Hansen, Senior HSE Manager, PPE and TMSE, Ørsted.

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