



ENERGY

Offshore Maintenance in the UK North Sea:

Redefining Reliability, Cost Leadership, and Late-Life Value

The UK North Sea is entering an era where maintenance performance defines asset longevity, cost competitiveness, and the ability to transition responsibly into late-life and decommissioning phases. Years of process complexity, over-compliance, and reactive maintenance have constrained productivity and increased cost exposure.

A&M's late-life maintenance framework emphasises fit-for-purpose asset strategies, data-driven backlog management, and campaign excellence. It aligns maintenance execution with life-of-field planning, integrating commercial discipline, workforce optimisation, and operational readiness as the core levers for extending safe production and minimising total cost of ownership.

In very late life, maintenance shifts to a zero-based approach: preventive tasks are deliberately reduced where failure modes are not observed, while safety and statutory requirements remain intact.

Where this has been executed, costs fall without an increase in corrective work. In the UK North Sea, policy uncertainty is reducing capital spending, making excellence in maintenance the decisive lever for safe production and value.

In summary, this paper outlines how operators can modernise their maintenance models, reduce unnecessary work, and build resilience under tightening fiscal and regulatory pressures.



1. The Maintenance Challenge in Context

Across the North Sea, operators face rising maintenance costs and ageing infrastructure. Excessive corrective maintenance remains a red flag for reliability and cost performance, often signalling a “production-at-all-costs” mindset that drives unplanned downtime and exposure.

The regulatory environment compounds the challenge. The North Sea Transition Authority (NSTA) now requires operators to demonstrate asset integrity strategies aligned with cost efficiency, while OPRED and HSE are revising guidance to ensure safety cases remain current and proportionate to operating conditions, with a clear emphasis on barrier health and verification.

Recent government reviews, particularly the 2025 OSPAR 98/3 Derogation Consultation and updates to the Energy Profits Levy (EPL), underscore a wider shift toward performance-based stewardship and transparency across the late-life value chain. In practical terms, as policy uncertainty reduces capital spending, excellence in maintenance becomes the decisive lever for safe production and value.

2. Lessons Learned from the North Sea

Across the UK North Sea, many assets carry over-engineering maintenance processes and layered assurance. The result is a culture that prioritises activity over outcomes and leaves commercial discipline behind.

Common lessons include:

- **Lifecycle mis-calibration:** Maintenance plans not calibrated to each asset’s lifecycle stage lead to over-maintenance and reduced competitiveness.
- **Outdated safety cases:** Safety cases and barrier verification programmes drift from current operating conditions, adding cost without improving risk outcomes.
- **Working capital inefficiency:** Large inventories persist due to a “just in case” mindset, despite opportunities to consume or repurpose existing materials.
- **Overuse of redundancy:** “Insurance” maintenance and duplication of assurance efforts have yielded uneconomic barrels and offshore hours with little reliability gain.

Done well ‘manage by exception’ and ‘run to failure’ approaches, supported by robust integrity management, can yield immediate savings and improve reliability where appropriate. The guardrails are simple: keep safety and statutory requirements intact, confirm decisions with trend checks on corrective work and reliability, and adjust if adverse trends appear.





3. A Three-Phase Maintenance Transformation Framework

A&M’s playbooks across maintenance optimisation and late-life leadership advocate a three-phase approach to sustainable maintenance performance:



Phase 1: Integrated Activity Planning (IAP)

(turnaroundgrade planning discipline for maintenance)

Establish complete transparency across logistics, materials, permit and execution. Maintenance planning must mirror turnaround discipline, ensuring readiness, scope control, and critical-path execution for every work order.

- **Readiness and scope control:** freeze scope before mobilisation; verify job plans, spares, isolation/permit packs, and contingencies.
- **Criticalpath execution:** sequence work to protect production and safety; remove nonvalue tasks early.
- **Campaign planning (single operator):** bundle work to compress vessel/crew days and align spares with campaign cadence.
- **Verification:** confirm completion quality and barrier health; close findings before demobilisation.



Phase 2: Workforce Optimisation

Reshape offshore staffing models toward lean, multi-skilled core crews supported by rotating maintenance, campaign teams and retire non-value effort. The focus is on execution quality, flexibility, and cross-platform collaboration.

- **Lean, multi-skilled core:** cross-skill crews, reduce hand-offs, and keep a stable “core + campaign” rhythm.
- **Zero-based spares:** run down excess inventories with a consumption plan; align reorder points to campaign cycles.
- **Assurance that pays:** focus verification on barrier health and current operating envelopes; consolidate duplicated checks.
- **Late-life balance:** apply zero-based maintenance to reduce preventive tasks where failure modes are not observed and confirm the change through reliability trend checks (corrective work and availability).



Phase 3: Driving Cost Leadership

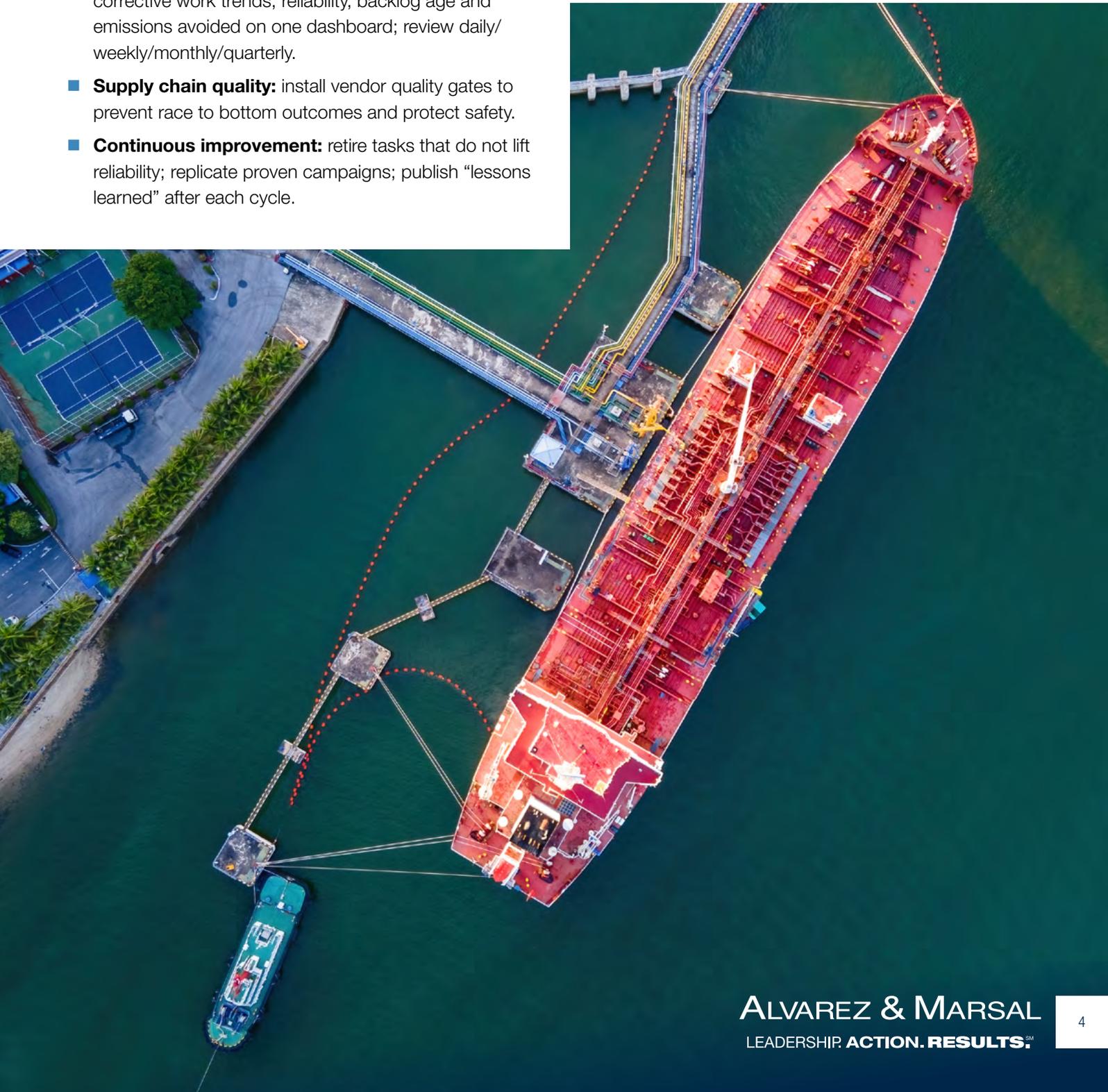
Performance metrics must cascade from unit cash flow and asset earnings down through every operational function. Each team must own its contribution to reliability and cost performance.

- **Contracts that derisk brownfield:** use reimbursable scopes tied to outcomes (availability, reliability, backlog burndown, emissions avoided); avoid lumpsum constructs for latelife assets.
- **Metric cascade and cadence:** track availability, corrective work trends, reliability, backlog age and emissions avoided on one dashboard; review daily/weekly/monthly/quarterly.
- **Supply chain quality:** install vendor quality gates to prevent race to bottom outcomes and protect safety.
- **Continuous improvement:** retire tasks that do not lift reliability; replicate proven campaigns; publish “lessons learned” after each cycle.

Result



Fewer hours offshore, lower exposure, and the same (or better) reliability—delivered through disciplined maintenance, not more capital. This framework ensures maintenance strategies are not just technically sound but also financially coherent and lifecycle-appropriate.





4. Challenges Ahead: Culture, Capability, and Complexity

The transition from reactive to predictive maintenance requires mindset and cultural shifts. Organisations must move from “busy equals productive” to “value equals impact.” The constraints are cultural, capability, systems, and regulatory load:

- **Change resistance:** Legacy work practices and fragmented planning cycles slow adoption of turnaround-grade discipline and single-operator campaign planning.
- **Skill renewal:** As the North Sea workforce ages, a new generation must be trained in digital maintenance systems, cross-skilled execution and lean execution.
- **System complexity:** Overlapping Computerised Maintenance Management Systems (CMMS) and duplicated workflows hinder integration, obscuring a single source of truth and dilute job-plan quality.
- **Regulatory fatigue:** Operators face growing scrutiny while struggling to simplify assurance frameworks without weakening safety or barrier health.

5. Key Success Factors

With the change challenges clear, this section sets out the success factors—planning discipline, a lean operating model, and outcome-based execution—that convert intent into results. The *Offshore Maintenance Carousel* identifies five success factors critical to achieving sustainable maintenance efficiency:

1. **Lean, multi-skilled crews:** keep a stable core offshore team and augment with rotating campaign crews; reduce hand-offs, prioritise first-time quality, and keep mobilisation tight.
2. **Lifecycle-fit maintenance strategies:** tailor maintenance to the asset’s life: in very late life, make zero-based decisions and reduce preventive tasks where failure modes are not observed – while keeping safety and statutory requirements intact and confirming trends.
3. **Streamlined planning and execution:** apply turnaround-grade readiness to routine work: freeze scope, assure job plans and spares, and clean the backlog so duplication and aged items disappear.
4. **Cross-platform collaboration:** bundle work across assets to compress logistics, share spares and create synergies.
5. **Integrated onshore support:** unify planning, materials, and permits under one plan and one dashboard; run daily/weekly reviews so decisions are fast and ownership is clear.

When combined, these create a high-performance culture driven by efficiency and ownership rather than compliance and inertia.

6. Late-Life Operations and the Link to Decommissioning

With the change challenges clear, late-life maintenance becomes the bridge from reliable and optimised operations to decommissioning readiness—turning planning discipline, a lean operating model, and outcome-based execution into predictable Cessation of Production (CoP). The *Late Life to Decom Playbook* emphasises eliminating non-value activity, aligning the safety case to evolving configurations, and standing up a dedicated transition team to remove strategic ambiguity—because ambiguity destroys value.

What early integration delivers

Operators that integrate maintenance and decommissioning early can:

- **Reduce late-life opex** (often up to ~20%) by retiring non-value tasks, simplifying assurance to barrier health, and compressing logistics through single-operator campaigns.
- **Improve schedule certainty** by locking a single plan of work, long-lead contracting, and daily/weekly reviews that link operational readiness to decom milestones.
- **Build internal competency** to manage regulatory expectations and tax efficiency.

This integration enables a smooth handover from operations to project-mode decommissioning, safeguarding safety, reputation, and capital efficiency.



7. Industry Outlook and Regulatory Developments (2024–2025)

With the change challenges clear, current outlook and regulatory developments set the operating envelope for maintenance decisions – shaping cost discipline, schedule certainty, and stakeholder expectations.

Regulatory:

The NSTA's *UKCS Cost and Performance Update 2025* confirmed record maintenance and decommissioning spend of £2.4 billion, with continued focus on campaign performance and well P&A timeliness. Complementary industry reporting notes regulatory investigations into missed P&A deadlines and a backlog risk if operators defer work.

Policy:

The UK Government's *Energy Profits Levy Consultation (2025)* proposes reforms to incentivise investment while maintaining fiscal discipline. Cost recoverability and tax relief on decommissioning remain under review. The November 2025 UK Government budget did not significantly change the fiscal regime, with EPL retained until 2030. Investment allowance removed and OGPM designed by yet to be legislated.

Operational:

- Offshore Energies UK (OEUK) reports that unplanned maintenance accounts for over 35% of downtime, with proactive maintenance strategies showing up to 15% cost improvement.
- Workforce optimisation initiatives across operators (e.g., Equinor, Harbour Energy) demonstrate sustained improvements in backlog reduction and offshore productivity.

Environmental:

OPRED continues to update offshore environmental guidance and communications, with recent outputs and policy papers shaping expectations for permitting, decommissioning, and environmental statements.

Following 2024–2025 court decisions, supplementary guidance now requires end-use (scope 3) emissions to be assessed in EIAs for offshore oil and gas projects, raising the planning bar for campaign design and documentation.

OPRED's PPC (Pollution Prevention and Control) guidance also clarifies combustion-plant rules offshore, reinforcing compliance expectations for maintenance campaigns.

8. The Path Forward

The path forward is disciplined execution: planning discipline, a lean operating model, and outcome-based routines that convert intent into results.

Delivering maintenance excellence in the North Sea requires more than process refinement, it requires leadership and conviction.

By combining operational pragmatism with commercial discipline, operators can transform maintenance from a cost centre into a strategic advantage.

The roadmap to success includes:



Embedding Integrated Activity Planning as the standard for all work execution.



Implementing data-driven backlog management to remove non-value work.



Adopt lifecycle-fit maintenance philosophies linked to life-of-field objectives (including very late life).



Make outcomes the common language: one plan, one dashboard; KPIs owned cross-functionally.



Keep compliance practical: barrier-health assurance, current safety cases, early permitting/EIA.





KEY CONTACTS



Al Carnrite
Managing Director
acarnrite@alvarezandmarsal.com



Nick Carnrite
Managing Director
ncarnrite@alvarezandmarsal.com



Al Fox
Director
alistairfox@alvarezandmarsal.com



Juliet Crosby
Associate Director
jcrosby@alvarezandmarsal.com

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482682-57757/March 2026
9958_FINAL

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