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Editorial

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Maritime Engineering

Editorial: Maritime engineering at the convergence of resilience, intelligence and energy transition

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Maritime engineering typically concentrates on demanding interfaces: between land and sea, structure and environment, design and operation. Today these interfaces are becoming more complex and developing at a fast pace. For example, offshore energy systems are moving into deeper waters, shipping is being reshaped by carbon constraints and energy-supply risks, and the integrity of ageing offshore and coastal assets are required to be properly reassessed under dynamic environmental conditions. For civil engineers, these developments are not confined to a specialist maritime domain but represent a critical infrastructure challenge.

The papers in this issue show how maritime engineering is moving from component-based design towards life cycle, data-informed and risk-aware infrastructure management. Gas pipelines, scour protections, floating wind turbine anchors, wave energy converters (WECs) and shipboard platforms may appear to belong to different technical domains. Yet they share a common question: how engineers design, monitor and maintain systems whose performance evolves under coupled mechanical, environmental and operational pressures.

The first group of contributions addresses detection, diagnosis and validation across different maritime and infrastructure systems. Silva *et al*. (2025) examine corrosion-induced incidents in gas pipelines and show how long-term public datasets can reveal patterns in service life, regional exposure and degradation mechanisms, thereby supporting targeted interventions for ageing infrastructure. The second paper by Tselios and Nikolakopp (2026), which focuses on simultaneous identification of unbalance and cracks in rotating systems, advances this theme through a hybrid physics-based and data-driven framework, combining signal processing approaches and artificial neural networks to achieve early crack detection. The third paper by Chambel *et al*. (2026) further develops the theme of damage assessment by proposing a statistical method for quantifying damage in scour protections for complex offshore foundations, with particular relevance to non-standard foundation layouts. The final paper in this group by Ning *et al*. (2026) develops a full-scale controllable inclination platform, along with finite-element modelling and data acquisition systems, to assess the structural integrity and serviceability of a drillship core-storage rack subsystem, with potential relevance to similar shipboard storage elements. Taken together, these contributions show how maritime engineering is moving towards more predictive, data-informed and experimentally validated approaches to infrastructure safety and asset management.

A second theme is energy transition. The fifth paper by Liu *et al*. (2026) studies the effect of carbon dioxide tax policy, green energy supply risk and market competition intensity on shipping companies' green transition strategies, offering theoretical guidance for carbon dioxide tax design and coordinated decarbonisation in port-shipping supply chains. The sixth paper by Qi *et al*. (2026) reviews the topic of scour from shallow to deep water and draws attention to a critical emerging challenge for floating offshore wind: the performance and stability of anchors in complex deep-sea environments. The seventh paper by Xia *et al*. (2026) establishes a rapid and accurate method to assess the conversion efficiency of WECs, narrowing the technical gap between theoretical research on WECs and its engineering applications. Together, these contributions reveal the substantial possibilities in marine decarbonisation.

In summary, the seven papers from this issue emphasise the growing importance of resilience, intelligence and energy transitions in maritime engineering, and address these themes from a broad range of technical perspectives. They reflect a rapid transformation in the field: from design under prescribed conditions to stewardship of adaptive systems; from isolated safety checks to continuous risk management; and from conventional marine assets to infrastructure that is safer, greener, more resilient and more intelligent. Hope you enjoy the present contents and for more related papers, the readers are directed to the official website of *Maritime Engineering* at https://www.emerald.com/jmaen.

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