**The 15th International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering & The 8th International Conference on Materials and Reliability**

**(QR2MSE2025 & ICMR2025)**

**July 23-26, 2025, Hohhot, Inner Mongolia, China**

**Special Session on: Artificial Intelligence for Reliability and Safety in Ocean Engineering**

Ocean engineering systems, such as offshore oil and gas platforms, floating wind turbines, subsea pipelines, and autonomous maritime vessels, operate in some of the world’s most demanding and unpredictable environments. These systems face challenges such as extreme weather, corrosive conditions, dynamic ocean loads, and increasing operational complexity. Ensuring their long-term reliability and safety is essential—not only to protect valuable infrastructure and human lives but also to prevent catastrophic environmental consequences.

Recent advances in Artificial Intelligence (AI) present transformative opportunities for enhancing reliability, safety, and maintenance strategies in ocean engineering. With the rise of big data and real-time sensing technologies, AI has become a powerful tool for extracting meaningful insights from complex marine operations. This includes intelligent condition monitoring, anomaly detection, risk-informed decision-making, and lifecycle asset management.

This special session provides a dedicated forum to explore how AI techniques—such as machine learning, deep learning, digital twins, reinforcement learning, and probabilistic graphical models—can be effectively applied to tackle reliability and risk challenges in ocean engineering. It seeks to bridge the gap between traditional engineering methods and emerging data-driven solutions, fostering interdisciplinary collaboration among experts in AI, reliability engineering, maritime safety, and ocean systems.

This special session aims to bring together researchers and practitioners from academia and industry to explore the latest AI-powered innovations that enhance the reliability, resilience, and sustainability of ocean engineering systems.

**Topics of Interest (but not limited to):**

* AI-based structural health monitoring for offshore platforms
* Machine learning for predictive maintenance of marine equipment
* Deep learning methods for fault diagnosis in ocean engineering systems
* Digital twin applications in marine asset management
* Data-driven modelling of ocean environmental risks
* AI-enhanced reliability analysis for floating and submerged structures
* Uncertainty quantification and risk modelling using AI
* Integration of IoT and AI for smart marine infrastructure
* AI applications in autonomous shipping and underwater vehicles
* Reinforcement learning for control and resilience in dynamic ocean environments
* AI-powered intelligent system for optimising the ship recycling process

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