NEMO NUCLEAR ENERGY MARITIME ORGANIZATION

MARITIME REGULATIONS FOR NUCLEAR APPLICATIONS AT SEA WORKSHOP
EVENT BRIEFING

8th and 9th July 2026
Lloyd's Register - 71 Fenchurch Street, London EC3M 4BS

Purpose and Context
The July NEMO Workshop brought together a wide range of stakeholders to improve the understanding of how nuclear technologies can be safely integrated into maritime applications.

The workshop was intentionally focused on the **roles, responsibilities, and interfaces between maritime and nuclear stakeholders**, rather than on specific reactor technologies. Participants included representatives from the IMO, national maritime administrations, classification societies, insurers, operators, shipyards, developers, and regulators.

A recurring theme throughout both days was that successful deployment of nuclear-powered ships and offshore nuclear units will require **integration of two mature but fundamentally different regulatory ecosystems**: the international maritime framework and the national/international nuclear regulatory framework.

Key Presenter Insights: Roles and Responsibilities

International Maritime Organization (IMO)
Ricardo Batista and Antti Noronen (IMO Maritime Safety Division) described the IMO's role as the global body responsible for developing maritime conventions, codes, and standards that are implemented by Member States. They emphasized:

- IMO develops the international framework, while Member States implement and enforce it.
- The revision of the IMO 1981 Code of Safety for Nuclear Merchant Ships (the Nuclear Code) is underway to create a technology-neutral and future-proof framework for nuclear-powered ships.
- IMO and IAEA are working closely to align maritime and nuclear standards.
- Future implementation must consider the interaction between ship lifecycle oversight (design, construction, operation, casualty investigation, and decommissioning) and nuclear licensing processes.

Flag Administrations

Taran Card (Bermuda Maritime Authority) explained that Flag States provide the legal jurisdiction under which ships operate internationally and are ultimately responsible for enforcing maritime regulations, even when survey and certification activities are delegated to classification societies.

Key responsibilities include:

- Registration and oversight of vessels.
- Enforcement of IMO conventions.
- Approval, certification, exemptions, and dispensations.
- Oversight of delegated organisations.
- Investigation and regulatory response following incidents.

A key takeaway was that maritime operations routinely involve multiple regulators and jurisdictions, a complexity that differs significantly from most land-based nuclear programmes.

Port and Coastal States

Suzanne Capper (UK MCA) highlighted the role of Port State Control in verifying compliance when vessels enter national ports and ensuring consistent application of international requirements.

Responsibilities include:

- Inspection of visiting vessels.
- Enforcement of applicable conventions.
- Detention of non-compliant vessels.
- Protection of local populations, ports, and coastal environments.

Discussions reinforced that coastal and port authorities are likely to play an important role in future nuclear vessel operations, particularly regarding emergency preparedness, environmental protection, security, and public confidence.

Classification Societies

Presentations and workshop discussions described classification societies as trusted technical assurance organisations supporting regulators, owners, and operators.

Their functions include:

- Development and maintenance of technical rules.
- Independent verification and certification.
- Technical support for novel technologies.
- Assistance to maritime administrations lacking specialist expertise.
- Support for consistent implementation across jurisdictions.

Participants noted that class societies can help bridge maritime and nuclear frameworks but do not replace the authority of nuclear regulators.

Owners and Operators

Workshop participants identified owners and operators as the entities with primary responsibility for:

- Safe operation of the asset.
- Crew competency and training.
- Asset lifecycle management.
- Operational decision-making.
- Compliance with regulatory and insurance requirements.
- Decommissioning, recycling, or transfer of the asset at end of life.

Discussions highlighted that owners and operators must balance safety, commercial viability, workforce considerations, and long-term liability management.

Insurers, Shipyards, and Manufacturers

Presentations from insurers and shipyard representatives emphasized that:

- Insurance arrangements for nuclear maritime applications will require new approaches that account for both maritime and nuclear liability regimes.
- Shipyards are responsible for quality construction, integration, supply-chain management, and delivery of compliant assets.
- Early engagement between designers, builders, insurers, regulators, and operators will be essential to reduce risk and avoid costly redesign later in the project lifecycle.

Shipping vs. Offshore Regulatory Frameworks
One of the most valuable outcomes of the workshop was the distinction between the regulatory environments for **shipping** and **offshore applications**.

Shipping Applications	Offshore Applications
Governed primarily through international maritime conventions and codes developed by IMO.	Governed predominantly by national and coastal-state regulatory frameworks.
Relies on Flag States, Port States, classification societies, and international standards.	Often relies on coastal-state authorities, national regulators, and site-specific approvals.
Designed for mobile assets operating across multiple jurisdictions.	Often applies to fixed or semi-fixed assets operating within a defined jurisdiction.
Benefits from highly harmonized international requirements.	Regulatory requirements vary significantly between countries.
Future nuclear framework expected to build upon SOLAS and the revised Nuclear Code.	Internationally recognised regulatory pathways remain less mature and may require significant adaptation of existing energy and industrial frameworks.

Several participants noted that offshore applications may not always operate under a traditional flag-State model and may instead be regulated primarily by the coastal State. This creates different licensing, environmental, security, and liability considerations from those applicable to international shipping.

Workshop discussions also highlighted that shipping is inherently multi-jurisdictional, while offshore projects often depend on a single host country's regulatory strategy. As a result, shipping may benefit more from standardised international requirements, whereas offshore projects may initially develop through national and bilateral arrangements, potentially achievable before deployment of nuclear ships is possible.

Key Themes from the Day 2 Interactive Workshop
The interactive workshop focused on identifying regulatory gaps, areas of alignment, and practical pathways for integrating maritime and nuclear requirements.

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Participants repeatedly emphasized that nuclear maritime applications should not create entirely new systems where existing frameworks can be leveraged. The challenge is integrating maritime and nuclear requirements while preserving the strengths of both sectors.

Regulatory integration rather than replacement



The group highlighted the importance of involving national nuclear regulators, security organisations, and safeguards authorities alongside maritime administrations. International treaty obligations related to safety, security, safeguards, and emergency notification will significantly influence future regulatory arrangements.

National Nuclear Authorities must be included early



Several participants argued that complete international harmonisation is unlikely. Instead, frameworks should facilitate mutual recognition, allowing countries and regulators to build upon established licensing and assurance activities performed elsewhere while maintaining national oversight responsibilities.

Mutual recognition is preferable to 'full harmonisation'



Participants identified responsibility for maintaining, reviewing, and independently assessing nuclear safety cases as a key topic requiring further work. The interfaces between operators, regulators, and classification societies will need to be clearly defined.

Safety Case ownership and assurance remain critical



Discussion confirmed that insurance and liability remain among the least mature areas for nuclear maritime deployment. Participants highlighted differences between shipping and nuclear liability regimes and stressed the need for further engagement through NEMO Working Group 3.

Insurance and liability require significant additional work



Attendees noted that technical and regulatory solutions must also support commercially viable operations. Future discussions should include charterers, cargo owners, financiers, banks, brokers, and other commercial stakeholders to ensure proposed frameworks are workable in practice.

Commercial viability matters



Participants broadly supported a staged approach to deployment, potentially beginning with controlled routes, green corridors, pilot projects, and limited stakeholder landscapes before expanding more broadly. Capacity-building for maritime administrations and practical demonstration projects were identified as important enablers.

Build confidence through stepwise deployment



Overall Workshop Takeaway

The workshop demonstrated strong alignment across the maritime and nuclear communities that existing frameworks provide a solid foundation for nuclear applications at sea. Success will depend on clearly defining stakeholder roles, integrating maritime and nuclear regulatory processes, resolving liability and insurance questions, and developing practical demonstration projects that build confidence among regulators, industry, and the public.