



NEMO

NUCLEAR ENERGY
MARITIME
ORGANIZATION

NEMO Working Group 3 ANNORAX Liability and Insurance Workshop 7 – 8 October 2026 LONDON



ANNORAX – KEY FINDINGS AND NEXT STEPS

1. Executive Summary

The NEMO Working Group 3 ANNORAX Liability and Insurance Workshop, held in London on 7–8 October 2026, brought together legal, insurance, regulatory, classification and industry perspectives to examine one of the key barriers to the deployment of nuclear-powered commercial shipping: **how liability can be allocated and insured when a nuclear reactor is operating within a mobile maritime environment.**

The workshop examined the legal, financial, regulatory and insurance challenges associated with the use and transportation of nuclear materials and nuclear-powered vessels in the UK and across international borders. The objective of the workshop was to frame the questions rather than determine all of the answers and create a shared architecture within which the Working Group can progress more detailed and individual legal and insurance issues.

The core problem is the lack of a civil nuclear liability regime for nuclear-powered ships and Floating Nuclear Power Plants (FNPPs), which leads to the lack of commercially available insurance cover. Whilst existing nuclear liability laws require strict limits and channel liability exclusively to a single operator, maritime law spreads liability across several parties, is fault-based and imposes limits based on tonnage.

Establishing liability amounts, channelling and jurisdictional rules that balance the rights of victims and future operators will be key in safeguarding a social licence to operate and ensuring the commercial viability of the sector. The Working Group also concluded that a sovereign guarantee was likely to be required to deal with residual risks and encourage supply chain participation.

The absence of a liability regime raises interface questions between any new regime and existing maritime law and practice. A key part of managing this interface will be developing a shared set of definitions and concepts to understand how any new legal and regulatory framework will work in practice. Key questions to consider included the need to reconcile potential conflicts between established practices for ship and nuclear safety, port readiness and what would happen in terms of refuge for nuclear ships in distress.

A number of ‘groupings’ were recommended identifying information that insurers would need to consider when developing their approach to nuclear ships and FNPPs; the categories of information initially proposed include: technology; vessel and operations; states and regulatory frameworks; ownership and contracts; and, casualties and claims.

The Workshop considered available historical precedents from the bilateral agreement associated with the N.S. Savannah and Otto Hahn. A set of core provisions and principles were identified which can be carried forward and developed as the basis for a future bilateral or plurilateral agreement to establish a nuclear shipping corridor.

A key question posed by the workshop was the level of ambition for this bilateral or plurilateral agreement – should NEMO be aiming for a point-to-point corridor or a region-to-region arrangement? In this regard the ability of individual EU member states to enter a bilateral or plurilateral agreement will be key.

The Working Group identified the need to include industry groups such as the World Nuclear Transport Institute, regulators, government and representatives from ports in further discussions. The Working Group also concluded that there could be transferable learning from the AUKUS project which has involved a tri-lateral agreement including sovereign guarantees.

The workshop featured contributions from a range of specialists, including **Ian Truman, Burges Salmon; Mikal Bøe, CORE POWER; Jez Sims, Lloyd’s Register; Ruth Keating and Anna Moody, 39 Essex Chambers; Elena de Boissieu, OECD Nuclear Energy Agency; Mark Smith, NorthStandard; Patrick (Paddy) Ryan, UK P&I Club; Erin Walton, West P&I; Mark Popplewell, Nuclear Risk Insurers; Jonty Slater, The Maritime and Coastguard Agency; Craig Burch, American Bureau of Shipping; Simon Forster, Excel Services Corporation; and Virginia Crosbie, CEO of NEMO.**

Key Areas Discussed

- **Nuclear liability frameworks:** The application of international conventions and national legislation governing liability for nuclear damage, including questions of operator responsibility, liability limits, jurisdiction, and compensation.
- **Maritime and nuclear interfaces:** The interaction between conventional maritime liability regimes and nuclear-specific liability arrangements, particularly where nuclear incidents involve vessels, ports, cargo, or third-party victims in coastal states.
- **Insurance requirements:** The availability and structure of insurance for nuclear marine risks, including liability insurance, property and hull coverage, pollution risks, cargo, and business interruption.
- **Risk allocation:** The importance of clearly defining contractual responsibilities between vessel owners, operators, charterers, cargo owners, ports, contractors, and governments.
- **Catastrophic and long-tail risks:** Consideration of the potentially severe financial consequences of a nuclear incident, including bodily injury (including the potential that strict liability creates a systemic risk to the insurance market at low level emission levels – Linear No Threshold), environmental damage, property loss, economic losses, and claims arising over extended periods.
- **Reinsurance and financial security:** Discussion of the role of reinsurance, government guarantees, indemnities, and other financial-security mechanisms where commercial insurance capacity may be insufficient. How Insurance Pools and P&I Clubs can be utilised.
- **Emergency response and claims management:** The need for effective emergency arrangements, incident reporting, claims procedures, and coordination between maritime authorities, nuclear regulators, insurers, and operators.

Across the two days, a consistent message emerged: the principal barrier was not the absence of individual components of a liability, insurance or regulatory system. Rather, the nuclear and maritime regimes have evolved separately and have not yet been reconciled for commercial nuclear-powered shipping. The workshop therefore focused on how the existing legal and insurance architecture could be adapted, connected and ultimately developed into a framework capable of supporting real commercial projects.

2. Setting the scene: What an effective nuclear maritime liability regime must achieve and what would a hypothetical nuclear shipping project look like?

This section of the workshop established a number of fundamental principles that any future framework will need to address.

In his opening legal analysis, **Ian Truman** highlighted the fundamental difference between nuclear and maritime liability regimes. Nuclear liability is based on **strict and exclusive liability**, normally channelled to a single licensed operator, with compulsory financial security and ultimately state backing.

Maritime liability, by contrast, generally distributes responsibility between owners, charterers, operators, salvors and other parties. Liability is often based on fault and can be subject to tonnage-based limitations. This created a fundamental interface problem. A single incident involving a nuclear-powered vessel could potentially engage both regimes simultaneously.

3 Project definition - a hypothetical nuclear shipping project

Mikal Bøe of CORE POWER set the scene outlining how the different civil nuclear liability regimes applied in the maritime arena.

Bøe highlighted a pressing issue: preserving legal certainty when a nuclear installation becomes mobile, moving between states and, by extension, different jurisdictions and maritime liability regimes. Bøe reinforced the importance of establishing a clear relationship between the flag state, licensing authority, shipowner, ship operator and reactor operator.

Furthermore, nuclear power could offer an advantage over combustion engines: greater speed, potentially allowing ships to travel significantly faster. Up to 65% more cargo can be delivered each year—a whole new industry and huge economic advantage.

4 Commercial nuclear shipping: Jez Sims, Director, Nuclear Technologies, Lloyd's Register

Sims compared the nuclear liability regimes based both on maritime law and land-based nuclear law under the Paris and Vienna Conventions. He also proposed a series of interface questions where there were gaps or overlaps between the regimes. He suggested a series of practical steps forward culminating in a hypothetical demonstration project with priorities for NEMO Working Group 1 on maritime regulations and Working Group 2 on safety.

5 The gap map applied to the project, Ian Truman, Burges Salmon LLP

Truman examined the land-based nuclear and maritime regimes in greater detail, covering the legal background, the conventions in force and the countries that had adopted them. His presentation including a gap analysis which included:

- The interface between maritime and nuclear liability conventions
- Ship safety versus nuclear safety
- Role of flag state – sponsorship, lower liability limits, wrap-around financial guarantees?
- Role of flag state regulator
- Role of port state regulators – joint design approval? Joint licensing? Mutual recognition? Harmonisation?
- Port entry requirements – power to ports?
- Licensed shipyards – ship construction? maintenance and refuelling? interim waste storage?
- Multiple licensees at licensed shipyards?
- Ports of refuge
- Salvage?

6 Historical precedents: Savannah, Otto Hahn, and the 1962 Brussels Convention: Ruth Keating, Anna Moody of 39 Essex Chambers.

The *N.S Savannah* and *Otto Hahn* demonstrated that nuclear merchant vessels could operate internationally where governments were prepared to establish appropriate bilateral arrangements. The workshop considered whether a modern version of this approach could provide an achievable route to early commercial deployment and identified key provisions from these agreements which could form the basis of a new bilateral agreement to establish a nuclear shipping corridor today.

7 Who answers for what? - Mikal Bøe, CORE POWER, Elena de Boissieu, OECD, Nuclear Energy Agency

Bøe outlined the main principles of liability as set out in the Brussels Convention with the associated channelling of liability to the licensee. Elena de Boissieu set out the detailed principles underlying established nuclear liability regimes and the applicable conventions, including the conditions that trigger liability and core principles such as channelling liability to the operator. Finally, she summarised gaps and overlaps in the channelling of liability between the regimes, as well as the potential applicability of general tort law and other legal principles. She also discussed a case study as to who would be liable in the case of a high seas collision.

8 Insurance: Marine P&I, hull and machinery and reinsurance with Mark Smith, NorthStandard and Patrick Ryan, UK P&I

Smith and Ryan provided the marine insurance perspective. They explained the structure of the existing Protection and Indemnity market and the way in which marine insurance responds to conventional shipping risks.

A nuclear-powered merchant vessel, however, presents a fundamentally different risk profile. Marine policies generally contain exclusions for nuclear risks, while nuclear insurance has historically been structured around fixed installations and identifiable licensed operators.

9 Key Interfaces: Convention on Supplementary Compensation, Paris and Brussels Conventions, HNS, LLMC and IMO with Elena de Boissieu, OECD Nuclear Energy Agency and Erin Walton, West P&I.

De Boissieu again returned to the key conventions. She set out the key interfaces in terms of supplementary compensation between the Paris and Brussels Conventions and their interaction with nuclear liability. She also set out a forward path based on broader adherence together with coherent treaty rules to reduce uncertainty.

10 Erin Walton, West P&I

Walton in her presentation discussed the existing conventions which had been called upon for such incidents as the Torrey Canyon. She outlined in detail the 1992 Civil Liability Convention (CLC) and how this interacted with the US 1990 Oil Pollution Act following the 1989 Exxon Valdez incident. Finally, she examined the 2001 Bunkers Convention as well as the 2010 Hazardous and Noxious Substances Convention. She examined the compensation mechanisms available when vessel owners are unable to pay for damage or repairs. Walton also explained how the US Oil Pollution Act 1990 allocates responsibility for damage-related decisions to the US Coast Guard, alongside the limited defences available, including acts of God or terrorism. Preventative measures must still have been taken where required.

11 Insurance 2: Nuclear risk insurance capacity and the Insurance stack: Mark Popplewell, Managing Director, Nuclear Risk Insurers Ltd, INLEX member and NEMO Director

Popplewell gave an overview of nuclear insurance pools and why insuring nuclear was different. He also summarised the areas where nuclear insurance expertise extends beyond liability. The greatest value of the international conventions was in providing certainty of liability, channelling the risk to the operator 'licence holder' and providing certainty around jurisdiction and compensation. Strict liability and the Linear No-Threshold hypothesis in terms of radiation exposure created difficulties for insurers for low-dose exposures to radiation and the potential for systemic risk. His key conclusion was that the risks arising from Nuclear-powered shipping cannot be fully addressed by conventional marine insurance alone.

12 Nuclear risk insurance capacity and the insurance stack with Elena de Boissieu, Deputy Head, Division of Nuclear Law.

De Boissieu outlined the requirements under current nuclear liability conventions and what the sector should aim to achieve, including a case study based on route analysis.

There were three key aspects to the framework necessary to facilitate nuclear maritime. These included:

- Legal certainty as to the liability framework to be applied;
- A workable requirement for insurance or other financial security; and,
- A mechanism in the instance where private insurance was unavailable or insufficient.

13 Jurisdiction, enforcement, EU competence with Ian Truman, Burges Salmon LLP

Truman set out the principles of unity of jurisdiction. The incident state had liability unless state of incident is uncertain, will fall back on the “installation state”. There were challenges around conflict rules and enforcement as well as an enforcement gap with third state claimants. Questions were also raised about the extent of the EU’s exclusive competence where a Member State or an associated state such as the UK wished to enter into a bilateral agreement.

14 Licensing and Class – how could nuclear propelled ships be licensed? What would classification societies need to know? With Craig Burch, Assistant General Counsel, American Bureau of Shipping (ABS) and Jonty Slater, Maritime and Coastguard Agency (MCA).

Burch set out the work that ABS was undertaking to accelerate commercial maritime nuclear and advanced nuclear reactor technologies. This included an analysis of the different interface between nuclear and maritime and the rules and requirements for nuclear maritime.

Classification verifies aspects of the vessel’s safety and adequacy, within the scope of the duties allocated by the flag state. The interface document is an important tool developed early in the project. It brings together stakeholders, owners and officials, clarifies which standards apply, and coordinates reviews. Maritime nuclear vessels can work on inclination of 30/45 degrees for a static and dynamic heel respectively. This was double that of a conventional ship; however, operators will need to prove this is safe. Maritime nuclear vessels also have up to a month of emergency power supply compared to a conventional ship’s 18-36 hours.

Slater in his presentation referenced aiming from a flag point perspective where to come from. It was difficult to rush UK government on decisions. Senior members of the government believe a project was 5-10 years away whereas in reality it is expected for 2029. There was a need to encourage action in UK government. Meanwhile, by comparison the US government is far more advanced. Requires significant discussion surrounding strict management of ports with boats coming and going. On this basis it was firstly going to be foreign-flagged ships coming into UK ports.

15 Corridor code integration- Simon Forster, Vice President, Nuclear Integration and Applications, Excel Services

Forster presented an AI-based methodology for integrating national and international regulatory regimes governing nuclear maritime into a single, evolving transport corridor. A key highlight was the missing aspects of regulation and reconciliation between the different regulatory, nuclear and maritime regimes.

He proposed a Corridor Code Integration (CCI) process whereby participating parties would agree corridors and maintain safety and cybersecurity throughout these routes. Next steps included identify platforms, building teams and secure backing.

The US had already begun integrating nuclear and maritime codes, the 'shackles' on port infrastructure had been removed by Trump and ports were now able to adapt and make changes. The US was aware that Europe was their biggest market. This meant that shipping needed to reduce its carbon emissions. This was one reason why the EU was interested in nuclear propulsion and floating nuclear power in ports.

16 Conclusion

Ian Truman

Truman summarised by stressing the need for a balance between the needs of victims with reasonable protections for operators. Insurance needed defined liability. He emphasised that the location of an accident is a key factor in determining which laws and policies apply. The fundamental question was what the industry should aim to achieve in advance of long-term multilateral solution i.e. point-to-point, or region-to-region.

The overall conclusions of Working Group 3 were as follows:

- Legal ambiguity needed to be resolved – a legal and regulatory framework are required for nuclear ships and FNPPs to be insurable;
- Clear Channelling of liability to a single entity in nuclear maritime activities;
- Adequate financial security to meet potential nuclear damage claims which is acceptable from a social licence perspective;
- A need to establish a common set of definitions to underpin the regulation of nuclear ships and FNPPs;
- Resolving jurisdictional uncertainties would be key along with an underpinning government guarantee;
- Early engagement with insurers and reinsurers when developing new nuclear marine projects;
- Contractual clarity, particularly regarding indemnities, exclusions, insurance obligations, and recourse rights; and,
- Retaining complete sovereignty may not be viable when trying to achieve a harmonious result.

**NEMO, Working Group 3,
8 October 2026.**