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CHALLENGES IN THE HARMONISATION OF LEGAL INSTRUMENTS ON 3S (SAFETY, SECURITY, SAFEGUARDS) AND CIVIL LIABILITY FOR MARINE-NUCLEAR SYSTEMS BETWEEN THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE INTERNATIONAL MARITIME ORGANISATION

Global shipping uses ~300 million t of fossil fuels annually, producing 3% of CO₂ emissions. In July 2023, the IMO set a net-zero emissions goal for 2050 (100% reduction by 2050 comparing to 2008 level). Supporting this goal, the maritime industry is pursuing deep decarbonization with nuclear ships, which is a ship provided with a SMR.

Today, some 200 nuclear reactors are operating on 160 vessels, mostly naval ships, icebreakers, and submarines. The interests in FNPPs have grown since Russia deployed the Akademik Lomonosov with 2 SMRs on board in 2020, and the interests in nuclear ships have also grown since the IMO mandate on decarbonization.

However, nuclear ships could pose risks in the events of reactor accidents, terrorists attacks, or proliferation threats, and the current legal instruments governing 3S (safety, security, and safeguards) and civil liability for nuclear ships are not sufficient to address these risks. Hence, the challenges in applying these legal instruments for nuclear ships include:

- The Convention on Nuclear Safety (CNS) is currently not applicable to nuclear ships.
- The nuclear-security instruments by IAEA focus on transport of nuclear and radioactive materials. And transport-security instruments by IMO need to extend to include nuclear ships. There is also a need to harmonize these two sets of security instruments for clarity and consistency.
- The safeguards of many non-water-based SMRs intended for nuclear ships by non-nuclear-weapons countries are not yet developed.
- Current Conventions on civil liability for nuclear damage may not be applicable to damages a nuclear ship incurred in attack by non-state actors in open sea.

This study addresses the 3S-and-civil-liability legal instruments of the IAEA and the IMO for marine-nuclear systems, with focus on the harmonization of these instruments between the two.

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