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I N T E R N A T I O N A L



**The urge
to merge**

Legal issues facing nuclear-powered commercial ships

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The prospect of nuclear-powered commercial vessels has arguably been on the horizon for some time. A basic framework is contained in SOLAS 1974 with more detailed requirements set out in IMO's 1981 Code of Safety for Nuclear Merchant Ships. However, aside from some limited examples of commercial nuclear vessels, there was little progress.

That would appear to be about to change, given the ongoing drive to reduce shipping emissions combined with recent global events (in particular Russia's invasion of Ukraine). Marine nuclear power is therefore back in focus, particularly so because it is not yet clear which of the other low emission options (e.g. hydrogen and ammonia) are likely to dominate.

The technology under consideration is based on modular unpressurised reactors, as opposed to pressurised water reactors (PWR). PWR are used in a naval setting and that is also the technology on which the Code is based. The Code also applies a very prescriptive approach not in line with the more outcome orientated practice used generally in the nuclear sector – see for example the Safety Standards of the International Atomic Energy Agency.

One of the biggest challenges is therefore establishing a modern multi-lateral regulatory framework. This will however take time and it might be well in to the 2030s before the IMO has an updated Code, by which time it is intended that nuclear powered ships will be in operation.

Based on the views of the stakeholders in this sector, initial progress is likely to take place at a bi-lateral level with like-minded states implementing a regulatory framework that will allow the technology to be used successfully. One can see that cooperation between states such as the US, the UK, France and

Japan (who have significant collective nuclear experience) may pave the way for a multi-lateral approach by the IMO in due course. The UK is already looking ahead to such an approach as it is now enacting legislation to implement the Code. It is also helpful that the classification societies are moving forward in this area – for example, LR intends to publish high level requirements in 2023 and ABS has a contract from the US government to research the barriers to progress.

Perhaps one of the key regulatory issues for stakeholders is the emergency planning zone (EPZ) – an area within which detailed plans are required in case of emergency. For land based nuclear reactors, EPZs cover a considerable area. However, that would present a significant problem in the context of a nuclear-powered ship moving between ports. The suggested solution is that the EPZ should be much smaller and limited to, potentially, within the confines of the ship. This is on the basis that the technology utilises unpressurised reactors, which do not pose the same risk as PWR.

On the basis that these and other important issues (in particular costs and decommissioning) can be resolved, important contractual questions will arise. At a shipbuilding level, the terms of any shipbuilding contract will need to be clear on the issue of how (and where) the nuclear reactor is to be installed and commissioned.

Careful thought will also need to be given to the interaction of post-delivery shipyard warranty obligations and ongoing maintenance arrangements for the reactor. Post-delivery, thought will need to be given to ownership of the reactor and stakeholders will also need to grapple with discrete issues such as whether it should be permissible to arrest a ship powered by a nuclear reactor. ●