Making up the leeway: meeting the skills challenges of Net Zero in maritime

Keir Gravil explores the challenges and opportunities of skills and training for the future of the maritime industry as it strives for Net Zero

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The future of maritime in a world of Net Zero will look a lot different; how we think about developing the skills needed to meet decarbonisation challenges is the key to its success.

The maritime industry plays a vital role in global trade and transportation, and as the world progresses towards a greener future, the industry faces significant challenges in training and educating seafarers to effectively utilise developing, net-zero technologies aboard ships. The industry's transition to sustainable practices and the adoption of advanced technologies demands a skilled workforce that can operate, maintain, and repair these innovative systems.

When considering the challenges posed by Net Zero for training, education, and certification of seafarers, we must draw insight from education providers, ship operators, and technology manufacturers. Understanding the gaps now will allow us to meet the problems decarbonisation poses in the near future and highlight key areas for focus to ensure we can achieve what we need to over the coming years and decades.

Understanding the scope of technological advancement

The International Maritime Organisation (IMO) has mandated that global shipping must reduce its reliance on fossil fuels and halve its total greenhouse gas (GHG) emissions by the year 2050. This poses perhaps the biggest challenge the maritime industry has ever faced and includes:

- Reducing annual GHG emissions to 40% of 2008 levels by 2030.
- Emissions from international shipping should reach net zero on or around the year 2050.
- Uptake of zero or near-zero GHG emission technologies, fuels and/or energy sources to represent at least 5%, striving for 10%, of the energy used by international shipping by 2030.

Meeting the IMO's goals has trigged an unprecedented rate of technological advancement and yet, many believe that current targets, and the work being done to meet them, are still not ambitious enough to avert climate catastrophe. Regardless of your view, the maritime industry must solve the problems generated by new propulsion technologies rapidly and develop additional new technologies to meet its targets.

The UK shipping technology sector contributes around £4 billion to the UK economy and will be worth £13 billion annually by 2030. As the maritime industry moves towards Net Zero, shipowners and operators will be impacted by the requirement to change some, most, or all of their vessels and propulsion technology, and ensure that their seafarers have the skills to deal with these changes.

The adoption of net-zero technologies such as alternative fuels (methanol, ammonia, or hydrogen), electric propulsion, fuel cells, and even nuclear systems will require seafarers to acquire new skills and knowledge. This will require changes to the certification of seafarers who operate these new systems. However, continued uncertainty about industry direction plus the adoption rate that these technologies require poses a significant challenge for training and certification. The Standards for the Training and Certification of Watchkeepers (STCW) is heavily focused on conventional fossil fuel-based technologies and must adapt to encompass a wide variety of different powering and propulsion solutions

in the future. Traditional training certification regimes can take time to adopt new developments, resulting in a widening gap between industry demands and seafarers' skills.

Training infrastructure: how can seafarers get to grips with new kit?

The UK is often cited as being one of the best places for mariner training in the world. However, a recent Maritime Skills Commission report concluded that there are potential shortcomings for mariner training in the UK. The UK is a signatory to the IMOs convention on the Standards, Training and Certification of Watchkeepers (STCW) and ratified the convention in 1980. However, while the STCW convention sets out the minimum standards for mariners, the latest Maritime Skills Commission report outlines a desire to exceed these, and indeed going above the minimum standards has often been a feature of UK mariner training that should continue.

To train seafarers in future technologies, appropriate training infrastructure is vital. However, setting up dedicated training facilities to simulate and practice on advanced systems is a resource-intensive endeavour. Many maritime training establishments lack funding and infrastructure to provide hands-on training for cutting-edge technologies. Additionally, the remote locations of some maritime institutions make it difficult to access the latest equipment and expertise required. Some have already invested in Virtual Reality systems to provide practical training, but the uncertain direction of industry means that despite using simulation to help with training, knowing what to teach remains uncertain.

Seafarer training relies heavily on qualified and experienced instructors and trainers who possess the right knowledge and expertise. With the emergence of new technologies, demand for trainers well-versed in net-zero practices will inevitably increase. However, finding instructors with expertise in emerging fields will be a challenge. Retraining existing instructors or recruiting new ones with the required skills may take time, further delaying the implementation of Net Zero training programs. It is clear that a knowledge transfer will be needed between OEMs producing new solutions and the education establishments providing training to future seafarers. Extensive cooperation and collaboration between industry and education will be needed to meet future demand.

To prepare future seafarers, existing training syllabi and the certification that goes with them, need to be amended, updated, and aligned with the changing technological requirements of ship operators and wider industry. This will require a comprehensive curriculum review to include topics related to net-zero technologies, environmental regulations, and energy-efficient operations.

However, the process of developing training programs can be time-consuming and requires close collaboration between training institutions, OEMs, shipowners, and industry stakeholders. Additionally, integrating these changes into the existing STCW framework and ensuring global compliance poses additional challenges. The IMO's Hong Kong Convention took 14 years to ratify and this timeline is unacceptable for Net Zero - the climate will not wait.

Bridging the gap: challenges of meeting future training needs for mariners

Frazer-Nash's own studies have identified five key areas where gaps will need to be bridged if the maritime industry is to meet the challenges of training future seafarers in new technologies. These five areas are:

- Direction and leadership: the direction that the maritime industry is taking to meet the requirements of global decarbonisation drive is unclear at present, although some major companies are taking adopting novel fuels such as methanol. There are myriad technologies available, and no defined path to any particular solution, which makes it difficult for colleges with limited resources to respond in a training capacity. Many in the maritime education and training sector believe that the change needs to be industry-led, allowing them to focus resources on training for technologies that are likely to endure.
- Resources: education providers will have resource challenges when responding to new training requirements; generally new training courses can take up significant resources in terms of time, cost, equipment, and personnel to develop and deliver. The UK's education providers do not have these resources in abundance, and thus must be strategic in their allocation. Furthermore, they often have difficulty sourcing equipment for cadets and trainees to use in their practical training, which will be compounded by the introduction of new and novel technologies.

- Collaboration: recent discussions have highlighted that collaboration within the maritime industry is key and should not have a negative impact on competition. Similarly our own research revealed collaboration as an important part of the response to meeting the needs of training and education in the UK maritime industry. It's needed between educational institutions, and between institutions and industry.
- Timescale: the time available to implement new training and education for seafarers is limited and decreasing daily. The UK wishes to be an early adopter and implement training solutions even without a formal IMO requirement to do so, shortening timescales further. Timescales present one of the most acute challenges to Net Zero; unlike other problems, the goal posts cannot be moved.
- Costs: According to the UK Chamber of Shipping (UKCS), the UK is said to be the second most expensive place in the world to train a seafarer. The cost of developing a new course can be up to £12,000 for an education provider. The costs to sponsoring companies for training a cadet can range from £45,356 to £79,348 in 2021 prices. It is likely that as the range of courses increases, and demands on educators becomes greater, these costs will increase by a large amount

Charting the course for the future

The UK is a leader when it comes to the training of seafarers, and it is evident that we have the skills, initiative, and expertise to meet the needs of future generations of maritime professionals. However, to meet the ambitious aims of Net Zero and ensure we are prepared, developing a joined-up approach to training and certification is key. From developing new training syllabi that meet the requirements of future technologies, to ensuring education providers have the materials they need, being fit for the future will only happen with collaboration and communication between all stakeholders. OEMs, ship owners, regulatory bodies, education providers, and government need to work together so that future UK mariners have the skills they need to succeed and meet the challenges of decarbonisation.

Find out more

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