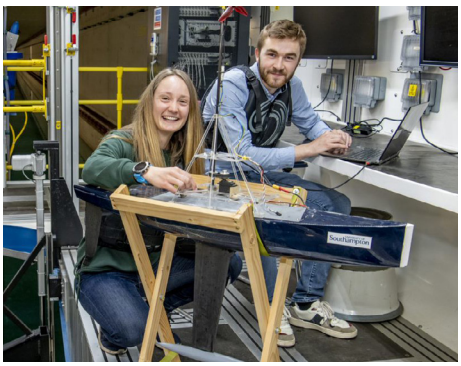
A Step Change in UK Shipbuilding Skills

September 2023

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Foreword from the Taskforce Chair

Dr Paul Little CBE, Chair of the UK Shipbuilding Skills Taskforce

Skills, Skills, Skills.....

As a seasoned mariner and career academic, and one who strongly advocates for both technological and professional education and higher skills, I was honoured to be appointed as Chair of the UK Shipbuilding Skills Taskforce. Now, one year on, as the Taskforce enters its third phase, I am delighted to present our collective UK Shipbuilding Skills Taskforce Report.

This is a game-changing report from an expert Taskforce. It is not the summative output of a well-meaning committee dependent on corporate consultants. Instead, you will read in the following pages the result of a 'for-industry-by-industry' national endeavour. It is the culmination of intense, weekly deliberations of focused workstreams and solution groups, distilled each month by an earnest Taskforce of shipbuilding and education experts, carefully chosen from all four nations of the UK and drawn from all parts of the UK shipbuilding sector.

In this foreword I want to pay particular tribute and to publicly thank all Taskforce members who gave so enthusiastically of their time, who injected new thinking to solve seemingly intractable problems and who by their collective purpose have energised a renaissance in UK shipbuilding across its constituent sectors including naval, leisure, heritage, workboat and the wider supply chain. Certainly, my eyes were opened to a reinvigorated, more collaborative, more can-do industry, inherently proud of its illustrious past but ever more eager to forge a bold and more sustainable future for UK shipbuilding.

Our report chimes with the UK government's Refresh of its 2017 National Shipbuilding Strategy which heralded a renewed ambition for naval procurement, and which sought to secure greater exports and more domestic contracts for UK shipbuilding. The 2022 National Shipbuilding Strategy Refresh reinforced the government's ambition for the UK shipbuilding industry, not least with £4bn of government investment into our shipyards and the UK supply chain, together with a clear expectation for greener vessels. Both helpfully highlighted the lynchpin importance of skills, and the implementation of the National Shipbuilding Strategy Refresh is well underway. The Taskforce was ever mindful of the skills required to deliver the 30-year cross-government shipbuilding pipeline of more than 150 new naval and civil vessels, as well as the additional pressures and opportunities for UK shipbuilding presented by AUKUS[1].

We structured our work into three distinct phases, each taking approximately 6 months:

1. **Discovery:** to draw together evidence of the skills needs and barriers within the industry.
2. **Prioritisation:** to identify priority areas of action to address barriers and ensure skills needs are met into the future.
3. **Engagement:** to share our findings with our stakeholders and advocate for our recommendations and the support we request from government.

Undaunted by the enormity of the challenge, the Taskforce was inspired to be evidence-based and solution-focused. At every turn, we reached out to our networks to remind ourselves of the reality for current shipyards and the growing industrial and professional skills gaps in our existing workforce. In addition, by proactively visiting centres of excellence and innovation across the UK we gained cutting-edge insights and honed our emerging solutions. We sought advice from top educational and industry leaders and the spirit of openness and partnership reached out through our roundtable dialogues to adjacent STEM and skills-hungry sectors. We were keen to avoid resolving our own unique shipbuilding skills challenges only to exacerbate similar challenges for our industry peers and so we made a particular point of connecting with skills leads in the related industries of nuclear, construction, rail, and aerospace. On our travels we met with the shipbuilding leaders of the future, meeting both further and higher education students. We subsequently resolved to further widen access pathways into our amazing industry for the many, not just the few, because UK shipbuilding in the 21st century is truly a high-skill, high-wage, 'job-for-life' industry.

Shipbuilding is on the cusp of a new era, very much restored to economic and government agendas. The shipbuilding sector is willing to invest in skills, in innovation and in infrastructure, seeking in return only a more consistent demand signal and lobbying for more favourable procurement regulations for UK shipyards. Ultimately, I believe that skills gaps and skills shortages will persist and hold us all back unless and until we nationally embrace a skills economy with the same fervour with which we embraced a knowledge economy. Most stakeholders now agree that the faulty logic of boom and bust must be consigned to the past, and the shipbuilding sector is up for delivery and not delay.

With a mindset of growth, 19 hugely talented Taskforce members dug deep and delivered time and time again. Our work was ably supported by our Secretariat team, provided by the Department for Education and the National Shipbuilding Office, whose work was augmented by their Devolved Government counterparts. I am personally enormously grateful to the Secretariat and especially to each Taskforce member listed at the end of this report. The UK shipbuilding industry will forever be in their debt.

[1] *https://www.gov.uk/government/news/british-led-design-chosen-for-aukus-submarine-project*

INTRODUCTION

UK shipbuilding will only thrive, both now and in the future, with a sustained pipeline of skilled and highly motivated people to support the industry to become more competitive. The UK Shipbuilding Skills Taskforce was established to build a collective understanding of industry's skills needs and to make recommendations for how to resolve shortages. We have considered how to take advantage of new and emerging technologies and draw on best practice from other 'skills-hungry' sectors. We have worked intensively together to develop a set of recommendations that seek to optimise available skills funding for shipbuilding.

Collaborative action has been key to our work, drawing together the voices of not only shipbuilding employers but also education partners, training providers, the trade unions, and the cross-government policy community, including Devolved Governments.

Why are shipbuilding skills important?

Shipbuilding is a strategically important sector to the UK, supporting over 44,600 jobs across the four nations in 2021 and adding £3.1bn to the UK economy in 2022. The shipbuilding sector in the UK includes organisations that deliver the design; build; integration; test and evaluation; repair; refit; conversion; and support of warships; commercial vessels; workboats; leisure vessels; systems and sub-systems.

A highly skilled and motivated workforce was recognised in the National Shipbuilding Strategy Refresh[2] as one of the most critical enablers of a thriving UK shipbuilding sector. For the sector to deliver the government's ambitious 30-year shipbuilding pipeline, alongside commercial and export orders, it needs an equivalent pipeline of skilled people to ensure it has the capability to design, build, maintain and repair world-class vessels.

The wide range of skills needed by the sector reflects the breadth of the UK shipbuilding sector and includes everything from traditional skills like carpentry and steelwork, to engineering technicians and digital design engineers. Ensuring the sector has access to the skills it needs must be a priority for both the immediate and long term as growth in the sector relies on skills.

[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1061201/_CP_605____National_Shipbuilding_Strategy_Refresh.pdf

What was the challenge set by the National Shipbuilding Strategy Refresh?

The 2022 National Shipbuilding Strategy Refresh set the intent for government to work collaboratively with industry to create a globally successful, innovative, and sustainable shipbuilding sector that works for all parts of the UK. The National Shipbuilding Strategy Refresh sought to ensure a pipeline of skilled workers for shipbuilding into the future through setting ambitious targets for skills to:

- **Complete Skills Foresighting for the shipbuilding sector** by 2024, and update in 2027 and 2030.
- **Complete modelling of skills shortages** by 2024.
- **Reduce skills shortfalls by 35%** by 2027 and **50%** by 2030.
- Enable employers to report **improvements in skills availability and quality increases** by 25% in 2024, 50% in 2027 and 75% in 2030.

The National Shipbuilding Office will continue to track progress towards delivering these ambitions across the UK alongside the other priorities set by the National Shipbuilding Strategy Refresh.

Why did we need the UK Shipbuilding Skills Taskforce?

Our Taskforce was established to take the first steps towards meeting these skills policy ambitions from the strategy. We set out to:

- Foster an industry-wide understanding of the future workforce requirements to ensure that demand is clearly articulated to the UK skills system;
- Review detailed analyses of all relevant skills training and their uptake;
- Propose ways in which greater levels of talent can be attracted to the shipbuilding sector in quantities that meet industry demands;
- Leverage funding opportunities to their full potential; and
- Support skills development to catalyse new technologies (especially green technologies) to support UK shipbuilding.

Our project provided a ground-breaking opportunity for not only shipbuilding employers but also education and training providers and trade unions to work together to promote a common interest. Collaborative action has been key to our project.

A key focus was improving understanding of current shipbuilding skills provision and demands, drawing upon our expertise and collaborating with key stakeholders. Our research findings were not sufficiently robust to draw quantitative empirical conclusions on the exact size of skills gaps, but they did improve our understanding of the nature of current shipbuilding skills provision and demand and allow us to identify priorities for shipbuilding skills development as described in this report. Our full Terms of Reference[3] are at Annex A and summaries of our meetings[4] are available online.

[3] *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1134369/UK_Shipbuilding_Skills_Taskforce_Terms_of_Reference.pdf*

[4] *https://www.gov.uk/government/groups/uk-shipbuilding-skills-taskforce*

EXECUTIVE SUMMARY

Our work found that the key science, technology, engineering and maths (STEM) skills needed by the shipbuilding sector are sought after across the economy, so the sector should be viewed as part of a wider manufacturing and engineering skills ecosystem. We discovered a negative public perception of the sector, which forms a barrier to attracting new talent, especially in the context of high demand for advanced STEM skills. Small and medium enterprises in the sector face particular challenges in accessing apprenticeships and other training schemes, due to administrative challenges, needing more flexibility, or lack of awareness of the skills and funding systems. We believe that successfully managing the sector's skills needs will require continued cooperation and communication between the governments across the UK, industry employers, trade unions, regional partnerships and training and education providers. This will enable the skills system across all four nations to prepare and rapidly respond to the future's changing employer requirements, taking full advantage of the opportunities of technology advancements, market trends and national strategy, to grow the supply chain of UK STEM skills.

Our vision for the future is described on the following page.

Our Vision for the Future of Shipbuilding Skills

Our vision for the future of shipbuilding skills is one of collaboration and opportunity. There will be a greater awareness of careers in shipbuilding to give the sector a skilled workforce that is fit for the future, and able to utilise new and emerging technologies.

COLLABORATION

We want to continue our collaborative government and industry approach to champion UK shipbuilding skills needs. Having a skilled workforce will drive competitiveness, supporting UK shipbuilding to secure global export orders, creating further opportunities for investment in skills.

AWARENESS

We want people across the UK to know shipbuilding is increasingly high-tech, sustainable and inclusive, and inspire a diverse range of people to pursue careers in the sector.

OPPORTUNITY

We want our innovative sector to leverage the skills systems across the UK to offer a wide range of opportunities in high skill, high wage roles.

FIT FOR THE FUTURE

We want to enable individuals to develop their skills and keep pace with technological changes. The sector's commitment to skills development will support industry to utilise emerging technology, as well as drive productivity and economic growth. This will allow the sector to be at the forefront of shipbuilding technological and environmental innovations that have the potential to improve UK shipbuilding export performance and meet our ambitious net zero targets.

The diagram below shows what we found during our discovery phase, linking these findings to our four priorities and the recommended activity we call on government, educators and industry to deliver. These recommendations are integral to achieving the skills ambitions of the 2022 National Shipbuilding Strategy Refresh. Our requests for support from governments across the UK fall under each of these priorities for shipbuilding skills development and are described in more detail later in this report.

Our Discoveries	Our Priorities	Recommendations for Employers	Recommendations for Educators	Government Support
Once the UK Shipbuilding Skills Taskforce's work is complete, there is currently no planned focal point to drive shipbuilding skills improvements • The voice of shipbuilding as a whole (including leisure, naval, and commercial needs) is not loud or clear enough to advocate for the sector's skills needs.	**Collaborating on shipbuilding skills**	Continue to collaborate through an industry-led group to champion UK shipbuilding skills needs and deliver our recommendations	Continue to collaborate with industry to develop skills for shipbuilding	Support and facilitate the industry-led group to represent shipbuilding's skills needs
Promotion of shipbuilding careers needs improvement • Public perception of shipbuilding is dated and negative. • Shipbuilding fails to adequately describe and communicate the wealth of possible career opportunities in the sector. • Work is needed to encourage more people to join the sector. • Work is needed to encourage people to stay within the sector.	**Promoting shipbuilding as a vibrant and inclusive sector**	Establish a new narrative championing shipbuilding as increasingly high-tech, sustainable, and diverse Build a career pathways framework to inform existing and future shipbuilding workers Promote inclusivity and create opportunities for everyone	Help promote shipbuilding careers by linking the curriculum to maritime careers	Promote the new narrative for shipbuilding, with a campaign to showcase the exciting career opportunities available Support the creation of the career pathways framework to inform existing and future shipbuilding workers
Shipbuilding skills needs look different in each nation of the UK • Education is devolved, but all four nations are focussed on responding to employer needs, enabling access to good jobs, and growing STEM skills. • Skills needs are different across regions, led by shipbuilding product mixes e.g. leisure, naval, commercial. • Quality of training is not consistent everywhere, and having different systems in each nation creates complexity. This is hard for smaller businesses to navigate and means employer awareness of skills products is a challenge.	**Leveraging and enhancing the existing skills system**	Commit to training the trainer Demonstrate shipbuilding's commitment to skills development through benchmarking initiatives Raise awareness and increase use of the opportunities in the UK skills systems Pledge your commitment to this skills development best practice	Spread best practice by joining a network of excellence in shipbuilding training provision	Convene a network of excellence for shipbuilding training providers to help shipbuilding employers access the skills they need Provide bespoke bootcamp-style investment to support boatbuilding on the south coast of England
The sector will need to respond to changing skills needs and emerging technology • Skills systems are not agile enough to rapidly respond to technological change. • A culture that supports reskilling and upskilling will be essential; behaviours and processes are just as important as skills. • Skills demands will fluctuate over time, driven by changes in market demand and new technologies.	**Ensuring shipbuilding skills are fit for the future**	Engage with Skills Foresighting for shipbuilding Pilot a microcredentials approach to training in advanced manufacturing technologies	Collaborate with governments and employers to make learning more flexible and modular to support upskilling and reskilling	Make systems that allow for more flexible and modular learning, to more rapidly respond to the needs of employers


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This diagram shows how our recommendations link back to the 2022 National Shipbuilding Strategy Refresh skills ambitions.

National Shipbuilding Strategy Refresh skills ambitions	OUR RECOMMENDATIONS	We need government support to:
COMPLETE SKILLS FORESIGHTING FOR THE SHIPBUILDING SECTOR	• Engage with Skills Foresighting for shipbuilding. • Educators to collaborate to make training more flexible and modular to meet future skills needs.	1 Make systems that allow for more flexible and modular learning, to more rapidly respond to the needs of employers.
REDUCE SKILLS SHORTFALLS	• Pilot a microdentials approach to training in advanced manufacturing technologies. • Establish a new narrative championing shipbuilding as increasingly high-tech, sustainable, and diverse. • Promote inclusivity and create opportunities in the sector for everyone. • Build a career pathways framework to inform existing and future shipbuilding workers. • Educators to help promote shipbuilding careers, by linking the curriculum to maritime careers.	2 Promote the new narative for shipbuilding, with a campaign to showcase the exciting career opportunities available. 3 Support the creation of a career pathways framework.
IMPROVE SKILLS QUALITY	• Employers to commit to training the trainer. • Employers to demonstrate shipbuilding's commitment to skills development through benchmarking initiatives. • Raise awareness and increase use of the opportunities in UK skills system. • Employers to pledge commitment to this skills development best practice. • Educators to spread best practice by joining a network of excellence in shipbuilding training provision.	4 Convene a network of excellence for shipbuilding training providers to help shipbuilding employers access the skills they need. 5 Provide additional Skills Bootcamp investment to support boatbuilding on the south coast of England.
MODEL SKILLS SHORTAGES	We were unable to complete the National Shipbuilding Strategy Refresh ambitions to model skills shortages which is why we recommend the UK shipbuilding enterprise continues to collaborate through an industry-led group, to champion UK shipbuilding skills needs and deliver our recommendations.	6 Support and facilitate the industry-led group to represent shipbuilding's skills needs.


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THE UK SHIPBUILDING LANDSCAPE

It is important to set in context that our work is one of several interdependent government-led measures under the National Shipbuilding Strategy Refresh, which together aim to improve the competitiveness of the UK shipbuilding sector, so it is best placed to secure government, commercial and export orders in the future. It is essential that government delivers on the National Shipbuilding Strategy Refresh in full to deliver a once-in-a-generation transformational change for UK shipbuilding. These strategy ambitions to unleash export potential and growth rely on a highly skilled workforce. However, the sector must have a secure and consistent pipeline of work to be confident enough to increase investment in training and ensure skilled workers are in place, at the right time, to fulfil its economic potential.

This is why we believe that a stable, consistent and guaranteed order book for UK shipyards will be critical to unlocking greater collaboration between employers and incentivising the sector to invest in its future workforce. While the policy interventions to enable this are not within our remit, we nevertheless call upon the government to put in place the conditions to prioritise UK shipbuilding in its procurement programmes by reforming legislation. This certainty should include a commitment from government to make timely decisions on contract award for its programme of work, as delays in government decision-making make it difficult for industry to plan and assign resources.

We see government procurement regulations that foster collaboration and innovation across the sector as a critical enabler of a robust UK shipbuilding industry throughout the supply chain. Key to this will be building more of the 30-year government shipbuilding pipeline, outlined in the National Shipbuilding Strategy Refresh, within the UK. This pipeline lays the crucial foundation for UK shipbuilding skills development. We also remind the government of the critical importance of creating the conditions for a stable domestic commercial order book by implementing a series of sector-specific and targeted interventions. One such example is the Shipbuilding Credit Guarantee Scheme. This scheme will facilitate access to finance for commercial vessel owners and operators, seeking to place orders at UK shipyards. We welcome the launch of this scheme and believe it has the potential to significantly benefit investment in skills.

The Shipbuilding Enterprise for Growth[5], which drives government and industry joint working to implement the National Shipbuilding Strategy Refresh, should support the government in any attempts to enable UK shipbuilders to compete on a level playing field with international competitors, many of whom are owned or supported by the state[6]. Comparison to equivalent national shipbuilding strategies launched by the governments of Canada and Australia shows international governments have taken different approaches to what is described in the National Shipbuilding Strategy Refresh, going further in supporting their industries. Differences include significant variations in domestic investment in shipyard facilities, and investment in a committed shipbuilding pipeline. The UK government should also redouble its efforts to fully realise the benefits associated with post-Brexit regulatory flexibilities. In doing so, government will signal a reinvigorated focus on supporting small and medium enterprises across the entire ship delivery value chain. This will turbocharge regional economies and deliver cross-departmental goals, exemplifying the benefits of integrated government policy and wholly delivering the far-reaching visions and aspirations of the wider National Shipbuilding Strategy.

The Taskforce believes that increased government investment in the UK shipbuilding industry will make its employers more confident to invest in skills and training. It takes significant time and money to train effective shipbuilders, and employers need to be confident that they have, or have a good chance of securing, enough work to make the investment in growing their workforce and hiring more apprentices, graduates and trainees, worthwhile. A thriving industry will also more easily attract skilled workers, who will feel more secure in their jobs. This will have a knock-on positive impact, even for the parts of the sector that don't rely on government contracts for much of their work. Leisure boatbuilders who have strong customer demand but struggle to attract and train enough employees will benefit from a reinvigorated image of the wider industry and yet greater levels of collaboration will be able to be unlocked.

By providing greater certainty of government investment in the 30-year shipbuilding pipeline, the erosion of skills resulting from the boom-and-bust nature of the sector seen over many years can be avoided. Shipyards will be able to maintain a skilled and adaptable workforce, improving overall productivity and competitiveness in the industry. This will lay the crucial foundations for increased investment in shipbuilding skills development. In conjunction with the measures described in this report, this will result in industry being well-placed to enter the 2030s 'match fit', with a shrinking skills gap and productivity levels in line with, or exceeding, those currently found across northern European competitors.

[5] https://www.gov.uk/government/groups/national-shipbuilding-office#shipbuilding-enterprise-for-growth

[6] https://www.oecd-ilibrary.org

SHIPBUILDING SKILLS REQUIREMENTS

The first phase of our activity was dedicated to discovery; improving our understanding of the skills needs and barriers within the industry, and the extent to which existing provision is meeting those needs. This chapter describes our findings and shows how they have shaped our priorities and recommendations as described in subsequent chapters. Significantly, we found the key science, technology, engineering and maths (STEM) skills needed by the shipbuilding sector are sought after across the economy. This demand is only likely to grow to meet government ambitions, such as the transition to net zero and delivering the 30-year cross-government shipbuilding pipeline as outlined in the National Shipbuilding Strategy Refresh. We also identified that as the sector adopts new technologies, new job roles may be created, whilst others become obsolete or require significant adaptation. These factors make strategic workforce planning crucial for the shipbuilding sector.

We initially sought to inform our understanding through independent research but struggled with low response rates to our surveys and requests for data. Nevertheless, we used our expertise and proactive engagement across our networks to shape our priorities and develop recommendations. Going forward, we strongly encourage industry to continue to work together on skills development, including sharing key information on skills needs with the National Shipbuilding Office, for the benefit of UK shipbuilding. This will be crucial to building a clear picture of skills needs in order to secure additional government investment.

The skills the sector needs

In our analysis, we found that different products drive different skills requirements, leading to regional differences in industry skills needs. However, some skills are vital to the whole of the shipbuilding sector. These skills include: naval architecture; marine engineering; electrical engineering; clean propulsion and alternative fuels expertise; digital design; steelwork; and project and business management.

Systems integration and supply chain management are key additional skills for the commercial and warship subsectors where the systems and supply chains can be complex. Shipbuilders who focus on warships can be highly dependent upon consultancy expertise and advanced sensor and communication systems skills as well as weapons system integration skills.

The workboat subsector has made a clear commitment to growing green skills to ensure the sector is environmentally sustainable. In the leisure sector, key skills include composite and wooden boatbuilding as well as carpentry, rigging and sail-making. Boatbuilding, sail-making and mast-making were all included in the 2023 Heritage Crafts[7] "red list" of endangered skills that could be lost unless the economy improves or more action is taken to protect them. To preserve heritage craftsmanship, traditional wooden boatbuilding and carpentry skills are vital.

[7] *http://heritagecrafts.org.uk/redlist*

Demand for STEM in a competitive environment

We found that many of the skills needed by shipbuilding today are also in demand in other sectors, putting shipbuilding in direct competition with other sectors that need STEM skills. The skills supply system is struggling to keep up with this demand, as recognised by the House of Lords Science and Technology Committee in December 2022[8] which found "there is a mismatch between the scale of the UK's skills gap and the solutions proposed by the government, especially given the UK's ambition to be a science and technology superpower". This points to a clear requirement to increase STEM skills in the round, and ensure the UK has these vital skills to shape the future. The shipbuilding sector would be a clear beneficiary of such activity.

Government priorities, where programmes led by different government departments are vying for the same skills, drive competition for skills. For example, shipbuilding programmes, submarine building programmes, nuclear energy and offshore wind projects all require people trained in key disciplines like engineering, welding and project management. Without cross-government coordination, there is a significant risk that competing demands and a disconnect between skills strategies will adversely affect shipbuilding and other sectors, especially in the context of a UK-wide shortfall in technical skills. And it is not just the UK that suffers from a STEM skills shortage. Other nations are rapidly trying to grow their STEM skills base too, for example Australia needs to grow a workforce capable of building nuclear submarines from scratch following the AUKUS[9] agreement. With this in mind, we should recognise the risk of people seeking to move abroad and use skills developed in the UK shipbuilding sector overseas is likely to increase.

We believe shipbuilding skills should be seen as forming part of a wider manufacturing and engineering skills system, and a wider maritime skills ecosystem with regard to alternative fuels, green skills, new technologies and autonomous vessels. Delivery of the skills the sector needs will require coherence between government, industry employers and training and education providers. This will be essential to enable the skills system to rapidly respond to changing employer requirements as technology advances, and grow the supply of STEM skills, making the best possible use of UK talent.

This means industry needs to continue collaborating, including with governments across the UK, trade unions, trade associations and educators and training providers, on skills.

Shipbuilding skills challenges today

The image of shipbuilding: Our work to explore future skills needs and expected innovation in the sector found that shipbuilding is perceived as an old-fashioned, deteriorating industry, which is a barrier to attracting new entrants. This perception is wrong; jobs in our sector are increasingly high-tech, digital, and innovative, at the cutting edge of technological change and the transition to green shipping. We need to share this message.

Supply challenges: For the warship, commercial vessel, and repair and conversion subsectors, the demand for skilled labour across steelwork, electrical engineering, mechanical engineering and support roles is greater than supply. This challenge is mirrored in the leisure marine and boat manufacture subsectors, where skilled labour is in high demand, with particular shortages reported of shipwrights and carpenters, composite laminators, marine engineers, marine electricians, and welders. Whilst industry is seeking to expand its workforce, the planning of training investment presents challenges, especially when there is an uncertain order book. These challenges have been exacerbated by Brexit, which has removed the ability for EU nationals (who had previously supplemented the UK shipbuilding workforce) to work in the UK on a temporary basis. This makes it more difficult for the UK shipbuilding sector to manage peaks and troughs in activity.

[8] *https://committees.parliament.uk/publications/33254/documents/179987/default/*
[9] *https://www.gov.uk/government/news/british-led-design-chosen-for-aukus-submarine-project*


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Retention challenges: Equally important is wastage over time, as people at all stages of their career choose to leave the shipbuilding sector and seek employment elsewhere, or opt to take early retirement. The latter has emerged as a trend following the coronavirus (Covid-19) pandemic, where some employers found their staff did not want to return to work. At other times people choose to leave the sector when faced with downturns in shipbuilding activity, where people fear for their jobs and are driven to move on to other industries such as rail or aviation, concerned that shipyards may close. Future success will be supported by breaking this cycle and retaining the highly skilled people shipbuilding generates over the next decade.

The skills needed in the shipbuilding sector are sought by many other sectors and when skills are in short supply, the relationship between employers and their employees is yet more important: employees must be valued by their employer. In this competitive environment, more people may seek to explore opportunities in different industries, instead of following a linear approach to career progression in a single sector. This zig-zag approach to career development enables people to gain diverse experiences and adaptability. Shipbuilding has the potential to benefit from this approach as people seek to bring new perspectives to the sector reflecting their unique experiences.

Successful employers adapt their job design and people management practices to meet the needs of their workforce. They work with their trade unions or other employee representative groups, demonstrating the ability to consider changes to working conditions to support employees to access a sustainable model of employment and promote retention. Employers further demonstrate their commitment to their employees by respecting all skills and capabilities equally.

Opportunities for volunteering and participating in non-core activities are also factors that support employee retention. This can be achieved in many ways, including encouraging and supporting membership of professional institutions; providing broader continuous professional development opportunities; and working in partnership with trade unions, and other employee representative groups to improve employee experience. It is vital that employers take an active role in upskilling their workforce, enabling staff to progress and make the transition from hands-on technical roles into leadership and management positions.

Impacts of an ageing workforce: Shipbuilding has an ageing workforce and workforce planning is critically important to shipbuilding employers, both to recruit new people to replace retirees and support knowledge transfer. Without effective workforce planning, the sector could suffer from knowledge gaps and skills shortages could increase, potentially compromising shipbuilding production capacity and timelines.

In this context, it is vital that the shipbuilding sector promotes the opportunities it has to offer to attract people to shipbuilding careers, and takes proactive action to support retention, including investing in training and continuous professional development. This will help to ensure shipbuilding has the skills needed to sustainably grow.

Career pathways into the sector

There are different skills systems in each nation of the UK, but we found they can all be difficult to navigate for employers. This is a particular difficulty for small and medium-sized enterprises that often do not have the resources to shoulder the burden of recruiting and administering staff studying to achieve qualifications while they are working. However, all UK nations provide a range of viable routes into a meaningful career in the shipbuilding sector, including:

Graduate entry: Shipbuilding represents a relatively small proportion of the demand for graduates. However, the shipbuilding sector does need graduates in engineering and technology, naval architecture, business and administration and computer sciences, including but not limited to software design, artificial intelligence and data specialisms. The sector is fortunate that UK universities have world leading marine departments that provide the graduate naval architects and marine engineers who are key to design, engineering and production management in many ship and boat building organisations. As demand increases for these skills, the sector

must engage with universities to ensure there is a sufficient supply of graduates.

Apprenticeships: Apprenticeships for key shipbuilding skills have been developed by employers for the industry. However, apprenticeship English and Maths attainment requirements can prevent people from achieving their qualifications. This acts as a barrier to people, who may have excellent trade and craft skills, being able to access career opportunities in shipbuilding. Higher and degree apprenticeships are increasingly offered by the shipbuilding sector, providing additional entry points as well as enabling career progression. Degree apprenticeships are an attractive alternative to university to those seeking higher skilled roles.

T Levels: T Levels are new 2-year courses available in England, taken after GCSEs and are equivalent to 3 A Levels in size and complexity. They include a 9-week industry placement. These courses have been developed in collaboration with employers and education providers so that the content meets the needs of industry and prepares students for entry into skilled employment, an apprenticeship or related technical study through further or higher education.

Direct school leaver entry: Some roles require minimal qualifications or experience, allowing people to gain practical experience and progress to higher-skilled roles if they are able to access the right in-work training. It is important to note that while qualifications may not be needed for entry into certain jobs, they may be needed to support long-term career progression.

Career changers: Many skills used in other industries are also required in shipbuilding, for example project management, logistics, engineering and welding. Career changers can use their existing skills and knowledge to develop meaningful careers in the shipbuilding sector, aligned to their individual development goals. It is important to make it easier for people to move into the sector where possible, recognising the skills they have developed elsewhere and providing ways for them to rapidly grow the sector-specific knowledge needed to support their transition to shipbuilding. We need to be mindful of the impacts on other sectors that face similar skills challenges and work collaboratively to ensure that everyone can access the skills they need.

Regardless of the educational pathway they use to reach a career in shipbuilding, it is vital new entrants to the sector are educated to a level that allows employers to deliver sector-specific training. We find this is not always the case and the quality of technical education is not consistent, with some regions having better provision than others. The education system must embed technical skills from an early stage and present a holistic learning offer that enables people of all academic abilities and with different learning styles to develop the skills they need to be work-ready when they leave education. We also call for the UK government and the

Devolved Governments to continue to invest in lifelong learning, giving the flexibility for people to train and study at any point in their life. This is increasingly vital as the pace of technological change in coming years will alter the skillsets people need. We welcome progress that is being made[10] but think more can be done.

For our sector to achieve sustainable growth, we recognise that our employers must leverage the existing, funded skills system. Nonetheless, having different infrastructure in each UK nation creates complexity, and the system must be appropriately funded, responsive to employer needs, and accessible to businesses of all sizes.

Shipbuilding skills for the future: the need to reskill

It is also vital that the UK shipbuilding sector invests in and adopts new technologies to increase productivity and competitiveness, in turn driving altered skills requirements. A new approach will be needed to support career-long reskilling across the shipbuilding sector as the industry adopts new technologies at increasing pace. To enable this, the shipbuilding workforce must be equipped with the skills needed to navigate technological advancements, drive innovation and adapt to changing industry demands. We recognise this will be influenced by the innovations, processes and technologies adopted by industry over time to improve productivity and competitiveness.

We identified that demand for skills in advanced manufacturing, data analysis, digital twins, communications, energy generation, green shipping, alternative fuels, virtual reality, robotics, artificial intelligence and quantum technologies is likely to increase as these technologies are more widely adopted by shipbuilding and as new technologies emerge over the coming years.

To unlock the benefits of emerging technologies, the skills needed by the sector will inevitably change, new job roles may be created, whilst others become obsolete or require significant adaptation. This will drive shifts in skills needs, in shipyards of all sizes and across the supply chain, which will herald a need for greater flexibility across the whole workforce, such as:

- **Digital and technological literacy:** As the industry embraces digitalisation, automation, and advanced manufacturing technologies, the shipbuilding workforce will need to have a strong foundation in digital literacy and be familiar with technologies such as computer-aided design (CAD), robotics, additive manufacturing (3D printing), and data analytics. Proficiency in using and adapting to evolving software and tools will be crucial.
- **Soft skills and adaptability:** In a rapidly evolving industry, shipbuilders will need to demonstrate adaptability, problem-solving abilities, and a willingness to learn and upgrade their skills. Effective communication, project management, and leadership skills will also be increasingly needed to coordinate complex shipbuilding projects.

We also identified that there would likely be an increased emphasis on the following specialisms:

- **Data analysis and cybersecurity**: With the increasing use of sensors and data-driven systems in ships, there will be a growing need for people who can effectively analyse and interpret data for improved vessel performance, maintenance, and safety. Moreover, cybersecurity skills will become even more important to safeguard critical systems, at production and during service, to protect against increasingly complex cyber threats.
- **Green technologies and sustainability:** The industry's focus on environmental sustainability and reducing emissions will drive demand for skills related to green technologies. Skills related to energy-efficient propulsion systems, alternative fuels, waste management, and compliance with environmental regulations will be required.
- **Advanced engineering and materials:** Advancements in ship design and construction techniques, that are already being adopted by some parts of the UK shipbuilding sector, will require increased numbers of engineers with expertise in advanced engineering principles and

[10] *https://assets.publishing.service.gov.uk/government/Lifelong_Loan_Entitlement_Consultation_Response.pdf*

materials. Skills in composite materials, lightweight structures, advanced welding techniques, and other innovative construction methods will be valuable.

- **Autonomous shipping.** As shipping becomes increasingly autonomous, new autonomous technology skills will be needed in shipyards.

It is important to note that these projections are based on current trends and expectations, but the exact future skill requirements may evolve further depending on technological breakthroughs, industry dynamics and emerging market demands. Continuous learning, upskilling, workforce flexibility and retraining will be crucial for UK shipbuilding to secure a competitive edge in this evolving international industrial landscape. More than ever before, **the shipbuilding sector will need to keep engaging with educators, the UK government and the Devolved Governments to make training more flexible and modular. This will enable course content to rapidly respond to employer needs to ensure shipbuilding is fit for the future.**

Technology enabling and protecting Naval Platforms: Naval Security Event Management Systems at Thales

Modern ships are brimming with high technology and are floating networks of information and operational technology, richly connected into the internet of things and increasingly exploiting artificial intelligence. It is vital that this technology can be trusted and is resilient to undesirable emergent behaviours. A diverse and highly skilled team from across Thales has developed one of the first naval cyber-security Security Event Management Systems (SEMS) for a modern warship. The SEMS monitors the ships Information Technology (IT) and Operational Technology (OT) networks in real-time, providing defence mechanisms and assisting human operators to recognise and respond to cyber-attack.

The scale, complexity and connectivity of modern ships mean that traditional approaches to security of information and operational technology are no longer adequate. Systems must change rapidly to meet evolving cyber threats, where unexpected and unpredictable events emerge, and it is impossible to design a static solution that will remain secure throughout its lifetime. In such complex and time-critical environments, humans are incapable of identifying and responding quickly enough to mitigate cyber threats before they propagate and affect operations. A highly capable and technically competent workforce is required to ensure that systems are in place to manage these threats. Organisations like Thales are continually recruiting and developing the skills of the workforce in IT & OT security architecture, cyber security engineering, and operational monitoring to complement existing skills in navigation, command and control, communications, and maritime operations to enhance the capabilities of the shipbuilding industry.

The implementation of this solution means that the entire ship's network of computer-controlled and communications systems is far more resilient to cyber-attack, enabling continued operations, and greatly enhancing the safety and effectiveness of the crew conducting their duties. This work has brought together naval architecture and design teams with experts in cutting edge cyber threat analysis and defence techniques, equipped them with new skills that are directly transferable to the rapidly expanding fields of IT and OT security and resilience, and enhanced the skills of the UK shipbuilding workforce.

"This was an exciting project to work on involving developing new skills in the team, working with experts from cyber security, and building a wider IT/OT knowledge base within the team for future ship builds" - Stephen Carruthers, Software Technical Specialist.

Inspiring individuals to pursue careers in technology

COLLABORATING ON SHIPBUILDING SKILLS

From the inception of the UK Shipbuilding Skills Taskforce, the value of cross-industry collaboration on skills throughout the whole of the UK has been self-evident. Although the Taskforce was essentially an 18-month task-and-finish expert project, we were mindful that skills demand requirements and the need for even closer collaboration will endure. We want to embed the nation-wide, industry-wide, cross-government partnership that we created through our Taskforce. We need to create a sustainable framework through which our industry, education and training providers, and the trade unions can speak with one voice on skills and ensure a strong mechanism for delivering our recommendations.

Our Discoveries	Our Priorities	Recommendations for Employers	Recommendations for Educators	Government Support
Once the UK Shipbuilding Skills Taskforce's work is complete, there is currently no planned focal point to drive shipbuilding skills improvements • The voice of shipbuilding as a whole (including leisure, naval, and commercial needs) is not loud or clear enough to advocate for the sector's skills needs.	**Collaborating on shipbuilding skills**	Continue to collaborate through an industry-led group to champion UK shipbuilding skills needs and deliver our recommendations	Continue to collaborate with industry to develop skills for shipbuilding	Support and facilitate the industry-led group to represent shipbuilding's skills needs

The challenges

There is a plethora of organisations in the maritime and manufacturing sectors whose remit is relevant to shipbuilding. These all work hard on behalf of their members, but none has a sole focus on the sector's particular skills needs. As a sector we have interdependent skills requirements, spanning maritime, construction and manufacturing disciplines. We must ensure that our voice is loud and clear enough to be heard by decision-makers and the wider public.

Therefore, we believe that a group dedicated to championing shipbuilding skills is required to enable future collaboration across industry, education and training providers and for the UK government and the Devolved Governments, to deliver our recommendations.

The case for continued collaboration

As our work will conclude in December 2023, we must establish enduring accountability for delivering our recommendations and embedding sector-wide collaboration. **We believe that a single group needs to act as a primary, unifying voice for shipbuilding's skills needs and hold government, industry and education providers to account for delivering our recommendations.** These will only have impact if they are fully implemented and maintained over time.

Our priority: Collaborating on shipbuilding skills

Recommendation: Continue collaboration through an industry-led group to champion UK shipbuilding skills needs and deliver our recommendations

We recommend that a new industry-led group is established to be a voice for shipbuilding skills across industry, educators and government. The group must continue to represent shipbuilding in all four nations of the UK. Our sector is diverse, and we must continue to cater for all constituent parts. This approach will enable us to continue to collaborate on shipbuilding skills, promote the job and progression opportunities offered by our sector, and attract talent.

Educators play an essential part in skills development, so key training providers must be engaged in this group. This will be essential to ensuring curriculum content is relevant to shipbuilding employer requirements.

Support from government: We believe that collaborative government and industry resource is required to make this vision a reality, and call on government to convene the group in the first instance. This group should have direct access to key departments, including the National Shipbuilding Office, the Department for Education and the Department for Business and Trade, as well as the Devolved Governments.

As with our Taskforce, shipbuilding employers, trade unions, key educators and academic researchers should be represented in membership. This will be key to ensuring the focus remains on delivery of the skills the sector requires now and in the future, driving forward the skills ambitions set out in the National Shipbuilding Strategy Refresh. It is essential to ensure shipbuilding employer representation includes small and medium-sized enterprises and supply chain companies. The membership must also be able to effectively engage with key stakeholders across the industry including, but not limited to: Maritime UK; the Maritime Skills Commission; British Marine; the Workboat Association; UKNEST; National Maritime; and the Society of Maritime Industries to ensure that the work of the delivery group is shared across the shipbuilding enterprise and coherent with other industry endeavours.

This group should use our recommendations to set the basis of its work and, beyond that, cohere collaboration and investment in support of shipbuilding skills. We have primarily focused on skills supply and demand, and more work is required to assess how best to retain and provide mobility and career development opportunities for workers once they enter the sector. Investigating this should be an early priority for the industry-led group and it should consider the findings to make further recommendations for industry and government.

To effectively advocate for shipbuilding skills, this group will need to monitor skills needs across industry, and feed this back to educators and governments across the UK. It must also work to sustain the momentum we have generated to demonstrate that shipbuilding is a vibrant and inclusive sector with career and job opportunities for all.

Common understanding to unlock collaboration: sharing data to improve our understanding and measure progress

The sector will need evidence both to support cross-government coordination and to allow the shipbuilding sector to measure progress against the National Shipbuilding Strategy Refresh ambitions. To ensure that the National Shipbuilding Office can provide the best support to UK shipbuilding, it is working across the sector to develop a Capacity and Capability Model, which will increase clarity on UK shipbuilding workforce numbers and give a mechanism to track progress in reducing gaps over time.

The National Shipbuilding Office Capacity and Capability Model will not survey the entire sector, but will be a useful tool for the National Shipbuilding Office to understand, among other things, the sector's current and future workforce requirements and the opportunities and pressures facing shipbuilding employers. The value and impact of this work is highly dependent upon industry's engagement with the National Shipbuilding Office as it gathers data to populate the model. This will support the industry-led group by providing workforce intelligence to inform its collaborative work to champion UK shipbuilding skills needs and unlock investment in skills for the sector.

BAE Systems Applied Shipbuilding Academy

Starting with a vision for a National Applied Shipbuilding Academy that creates focus, sponsorship and measurable impact across the shipbuilding's key and strategic capabilities, BAE Systems have committed £30M investment over 10 years towards an Applied Shipbuilding Academy.

The academy aims to attract next generation talent into shipbuilding and upskill existing staff to their maximum potential. The investment includes provision for a modern learning environment on the Clyde with supporting faculty to develop modern tailored programmes emphasising applied shipbuilding capability. A career academy serving from shop floor to boardroom, it is a collaborative effort with education sector partners and with an ambition for broader collaboration across the sector.

The Academy forms part of BAE Systems' strategic response to four key needs:

1. The need to boost the volume of skills available in the near and medium term to deliver its business plan.
2. To capture the applied learning from the last three decades of UK naval programmes and teach this to a new generation workforce.
3. To drive productivity improvement and enhance competitiveness, building on investments in advanced tools and facilities.
4. To ensure its workforce is prepared with the future skills needed to secure long-term success.

Through this investment, BAE Systems will secure a pipeline of industry-ready future talent, supporting up to 300 new apprentices and graduates each year in partnership with local further education partners. They will supercharge the core capabilities in existing teams to strengthen the capacity to deliver targeted productivity and quality improvements in current and future ship design and build programmes. With a forward-looking focus on technology, they will help employees develop the skills need for success in the future.

Simon Lister, BAE Systems Naval Ships Managing Director said: "through the Applied Shipbuilding Academy we will deliver capabilities at scale to ensure that current and future employees can perform, innovate, and grow in priority areas of strategic importance to our sector".

178 new apprentices on the first day of a new career in shipbuilding


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PROMOTING SHIPBUILDING AS A VIBRANT AND INCLUSIVE SECTOR

Our research identified that the image of shipbuilding is dated and negative in the eyes of the general public, including students and their families, and careers advisers. This makes shipbuilding less attractive to new entrants when compared with alternative career options, including those that require similar skills.

Shipbuilding must do more to collaborate on skills, promote job and progression opportunities, and attract talent. We see coordinated, sector-wide activity as a vital part of achieving this vision.

Our Discoveries	Our Priorities	Recommendations for Employers	Recommendations for Educators	Government Support
Promotion of shipbuilding careers needs improvement • Public perception of shipbuilding is dated and negative. • Shipbuilding fails to adequately describe and communicate the wealth of possible career opportunities in the sector. • Work is needed to encourage more people to join the sector. • Work is needed to encourage people to stay within the sector.	**Promoting shipbuilding as a vibrant and inclusive sector**	Establish a new narrative championing shipbuilding as increasingly high-tech, sustainable, and diverse Build a career pathways framework to inform existing and future shipbuilding workers Promote inclusivity and create opportunities for everyone	Help promote shipbuilding careers by linking the curriculum to maritime careers	Promote the new narrative for shipbuilding, with a campaign to showcase the exciting career opportunities available Support the creation of the career pathways framework to inform existing and future shipbuilding workers

The challenges

Our research into current careers advice on shipbuilding explored the barriers and potential enablers to people entering the sector. We found that work is needed to encourage more people to join shipbuilding, make its opportunities more visible, update its image to showcase the wide range of careers available, and attract more people to our sector. This should emphasise that with a clear pipeline of work, a career in shipbuilding can offer valuable job security, as well as giving opportunities for varied and rewarding careers that can take individuals from apprentice to CEO.

We need to do more to promote our sector, since people do not know that career opportunities in shipbuilding are so broad. Some of the less widely recognised skills needed by shipbuilding include: traditional craft skills; digital skills; and skills that support innovative new technologies.

We identified that shipbuilding's presence on social media, careers websites and even within the wider maritime sector is minimal, and where there is a presence, it often conforms to past stereotypes. Where there is activity to promote shipbuilding, it often fails to show diversity.

Together, this means the public perception of shipbuilding is dated, negative and fails to adequately describe and communicate the wealth of possible career opportunities in the sector. This makes shipbuilding a less attractive option compared to careers in other sectors, including those that also require STEM or manual skills.

Apprentice pathways at A&P and Cammell Laird (APCL Group)

A&P Group and Cammell Laird operate three major shipyards in England (Falmouth, Tyne and Birkenhead) and a military support business in Australia. The Group has around 1,500 full time employees.

Over 75 new apprentices complete their training and join the workforce every year and the scheme has for many decades provided high quality people to work in the shipyards. After initial training, engineering skills need years to fully perfect, so people need to commit to time in their chosen speciality. Visible senior management who have worked their way systematically through the ranks not only fuel ambition but also encourage people to perfect their skills at each stage of their career, rather than seeking advancement too early.

This long-term continuity also provides customers and other stakeholders with confidence, and shared experiences across all ranks build a strong team ethos and pride in work.

The current employment statistics across the group provide evidence of the benefits of this approach:

- The apprentice scheme is always oversubscribed.
- Completion rates for apprentices are c.99%.
- 50% of the Operational Board are former apprentices.
- 75% of Project Management are former apprentices.
- 80% of Production Management are former apprentices.
- 100% of Production Supervision are former apprentices.
- Staff turnover rates are extremely low.

Mike Hill, Managing Director, said: "It's a source of continuing pride that apprentices continue to make up the backbone of our business. This not only ensures we have the right people both now and long into the future, but also reaffirms our commitment to the communities we serve by providing top class employment opportunities for local people."

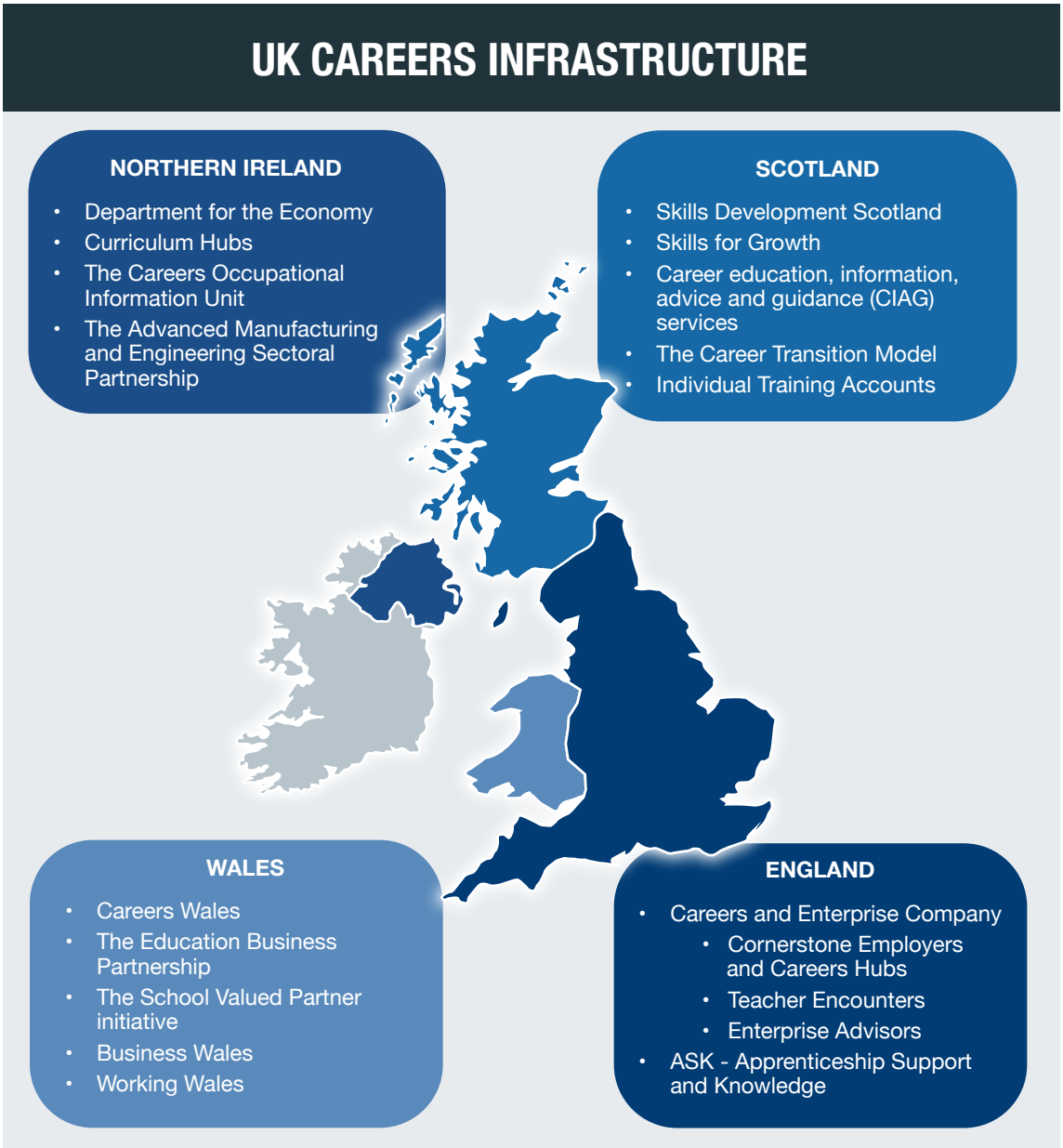
Kirsten Blood, Ship Manager, said: "Apprentices don't just bring their skills and abilities, they bring their drive too. Having an influx of new talent every year keeps our business dynamic and ready to adapt to changes in the industry."

Taylor Gibbins, Apprentice, said: "I've already learned a huge amount as an apprentice and I'm still learning every day. Working with people who've been on the same journey as I have and who are still here, now gives me lots of confidence for the future."

Apprentices involved in the building of the advanced polar research ship 'RRS Sir David Attenborough'

Misperception of our sector is compounded by the wider challenges surrounding careers advice. Perceptions of different careers are embedded at an early age and heavily influenced by family. Gender stereotyping is evident from age seven too[11], which narrows the pool of potential recruits and deepens the challenge of diversifying the sector. Work has been started to address this, for example Maritime UK's diversity and inclusion programmes, but there is more to be done.

Getting into schools to offer industry encounters can be difficult for employers, especially small and medium enterprises, and academic routes are often promoted over technical and vocational, or seen as for 'other people's children'. We found the current careers infrastructure needs to better be communicated and improved to ensure that people have equal access to good quality advice, training and funding wherever they are in the UK.



Summary of the UK careers infrastructure, additional details are at Annex A

[11] *https://www.fawcettsociety.org.uk/Handlers/Download*

Our priority: Promoting shipbuilding as a vibrant and inclusive sector with career and job opportunities for all

Recommendation: Establish a new narrative championing shipbuilding, showcasing it is an increasingly high-tech, sustainable, and diverse industry

Our sector must take a proactive and dynamic approach to attracting people to careers in shipbuilding. As a Taskforce, we recommend that the UK shipbuilding sector collaborates to establish a new narrative that presents an accurate picture of the industry today, showcasing that it is high tech, increasingly sustainable and innovative. The most important element of this is to develop a digital presence that represents these attractive and diverse opportunities, utilising digital platforms that are age appropriate.

We should disseminate our narrative across our stakeholder networks, embedding it in wider STEM skills narratives and Maritime UK's content on maritime careers and diversity. Teachers, careers advisers and current students all need to know more about the positive career opportunities in shipbuilding. This requires action from industry to promote itself, using its new narrative to showcase the opportunities available in the sector. Put simply, the more people know about the sector, the more they will want to be part of it.

Support from government: Promote the new narrative through a campaign. Our narrative and our commitment to providing career pathways that encourage growth and development of the shipbuilding workforce need to be promoted cohesively. We recommend that the National Shipbuilding Office supports the shipbuilding sector in achieving this by convening an industry-wide campaign to promote UK shipbuilding, including highlighting career opportunities, using this new narrative. Government support is needed to help the sector improve its digital presence and ensure shipbuilding remains in the national consciousness.

Recommendation: Build a career pathways framework to inform existing and future shipbuilding workers

Anyone interested in a career in shipbuilding, whether in school or already in work, needs to be able to understand what they are signing up for by joining our sector. To persuade them to come on board, we must demonstrate the range of opportunities for entry and onward progression. We know that 80% of the 2030 workforce is already in work[12], which means we cannot rely solely on young people to fill our skills gaps, and we must seek to attract people who currently work in other sectors or have left the labour market. We recognise that other sectors have the same ambition, given the shortage of skills across all STEM sectors.

To keep our existing staff in a competitive economy where STEM skills are at a premium across the globe, we also need to show them why they should stay, noting that with a clear pipeline of work, a career in shipbuilding can offer valuable job security in otherwise uncertain times.

[12] *https://industrialstrategycouncil.org/sites/default/files/UKSkillsMismatch2030*

Supporting the Cell and Gene Therapy Catapult: Enginuity's Skills Framework as a model for other STEM sectors

Current UK classification systems for roles in engineering and manufacturing are broad and don't have the granularity needed to track emerging skills needs in a changing industry landscape. Engineering and manufacturing-specific, real-time labour market information also needs to be communicated rapidly with industry professionals and stakeholders. With the cell and gene therapy sector growing rapidly, there was an increased and immediate need to highlight the roles available and to identify the transferable skills that could be brought to the sector.

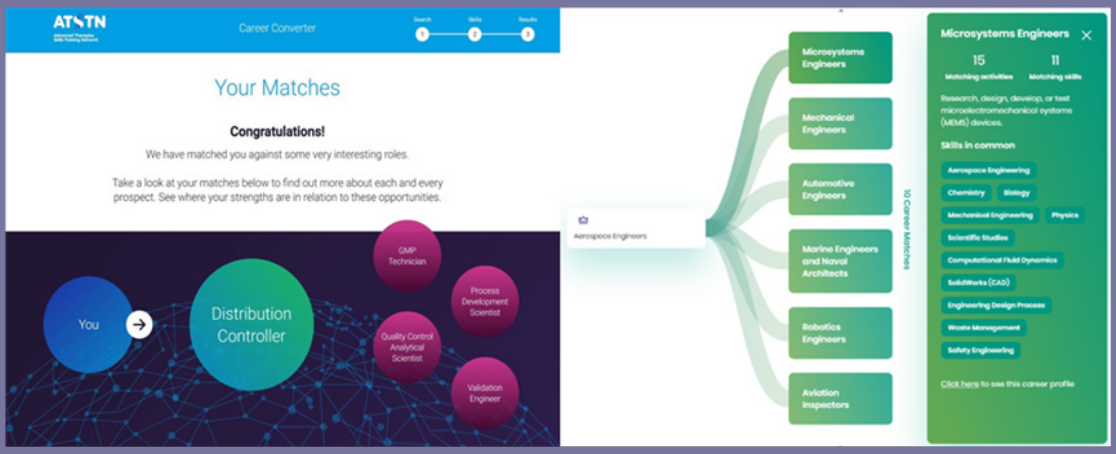
To address this, Enginuity developed a Skills Framework which offers a dynamic and adaptable skills taxonomy that integrates multiple data sources to unveil the intricate relationships between careers, skills, and employer-driven demand. It aligns the American Occupation Information Network (ONET) taxonomy with UK Standard Occupational Classification (SOC) codes, and links ONET classifications to specific job roles and employer requirements taken from Job Posting Analytics.

Enginuity then built a 'Career Converter' tool underpinned by the Skills Framework. This allowed individuals to enter information about their current job and CV to uncover the roles within the cell and gene therapy sector they may be suitable for and what transferrable skills they have.

The Enginuity Skills Framework is the enabler for a number of tools which allow sectors, employers and individuals to compare the skills and knowledge required by different occupations and roles across and within sectors.

Since launch of the Career Converter, 2000 individuals have accessed the platform, with a monthly average of 55 new users.

Shipbuilding is a key part of engineering and manufacturing, and its skills needs are similar to those in adjacent sectors. A Skills Framework and Career Converter tool for shipbuilding would help attract more skilled workers to a range of roles.



The Career Converter tool (left) and Skills Framework (right)

To support a new narrative for shipbuilding, we recommend that the sector collaborates to build a shipbuilding career pathway framework that can help inform existing and future shipbuilding workers about career and progression opportunities, drawing upon the approach taken by the Cell and Gene Therapy Catapult. Enginuity can use its expertise and experience to initiate this work as part of its charitable remit to support the sector.

Support from government: Fund further work on a career pathways framework. To ensure the shipbuilding career pathways framework is successful and reaches our intended audience, funding is sought from government to develop the content and disseminate the resource further. We anticipate that a competitive process will be required if our recommendation is accepted.

Recommendation: Educators in shipbuilding communities should link knowledge gained through the curriculum to maritime careers opportunities

Shipbuilding will only achieve its ambition to better promote its careers if educators are on board. Educators in shipbuilding communities should consider how knowledge gained through the school curriculum can be linked to maritime careers, to promote opportunities in their local areas and showcase the career opportunities available in their communities.

Maritime Futures: Helping the UK achieve Maritime 2050

Cowes Enterprise College on the Isle of Wight has created an integrated maritime curriculum entitled Maritime Futures, taught to every student in the first three years of secondary school. The curriculum contextualises knowledge gained through study of mainstream national curriculum subjects through a maritime careers lens. For example, robust academic knowledge, such as the physics of buoyancy and drag, find application in boatbuilding projects in Design Technology. Teachers from different subjects collaborate with each other and industry professionals to constantly refine and adapt the curriculum. Students visit state-of-the-art industry facilities and have employer encounters with a wide range of maritime roles.

The Isle of Wight has both a rich maritime heritage and vibrant contemporary maritime industries. However, as highlighted by the Maritime 2050 report, young people in school remained largely unaware of the history and opportunity of the maritime sector in their community.

Maritime Futures was created to address this deficit. It also seeks to teach young people about the strengths and achievements of a locality sometimes perceived as disadvantaged; to educate young people about maritime, an industry that is integral to where they live, and make them aware of the employment opportunities it affords; and to create a dynamic learning experience which seamlessly unifies academic knowledge and vocational skills.

Maritime Futures' impact has been significant. It has given young people a respect for the community in which they live, so that it is increasingly seen as a place of creativity and opportunity and improved their awareness of the variety of roles in the maritime sector. Some have gone on to choose a maritime career as a direct result of Maritime Futures.

After a visit to the Centre of Excellence for Composites, Advanced Manufacturing and Marine, one student said: "By the end of the day I thought this is it, I'm going to find out everything I can about being a maritime engineer and do this job!"

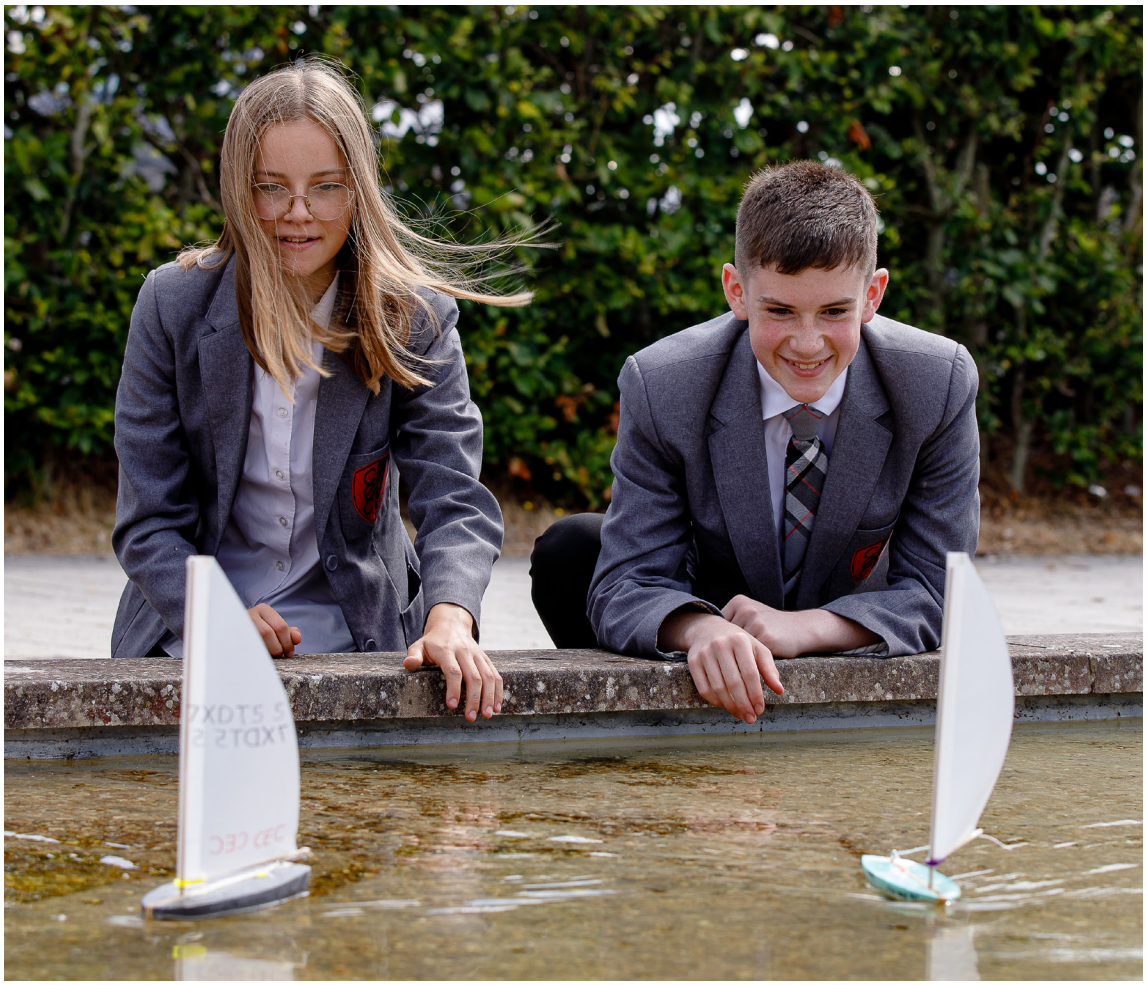
Cowes Enterprise College students discuss the local maritime sector on Cowes Beach, overlooking the Solent

Recommendation: Promote inclusivity and create opportunities in the sector for everyone

Industry must support its staff to grow the skills it needs, regardless of prior educational attainment, while helping individuals to develop at their own pace over their careers and achieve their ambitions. Employers should support a range of entry routes into the sector and recognise aptitude and potential over qualifications.

There have been recent moves in the sector to improve diversity, led by the exemplary work of Maritime UK's Diversity in Maritime[13] initiative and supported by pioneering organisations like Women in Boatbuilding[14], that are challenging and supporting employers in the sector to increase the diversity of their workforce. Shipbuilding employers are rethinking their approaches to recruitment to improve diversity, for example both Sunseeker and Babcock have introduced a new Production Support Operative role to create pathways into the sector for people who do not have specific prior experience or skills.

Embracing diversity as a sector will allow us to bring a wide range of perspectives, experiences and skills to UK shipbuilding, fostering innovation and creativity leading to improved problem-solving and better outcomes for the sector.



[13] *https://www.maritimeuk.org/priorities/people/diversity-maritime/*

[14] *http://www.womeninboatbuilding.com/*

Babcock's Production Support Operative Programme

Many companies struggle with a squeeze on the availability of skilled tradespersons such as welders. To address this, Babcock partnered with its trade unions to create and execute a new Production Support Operative (PSO) position in just six months. This supports capability development by reducing workload for tradespersons and creating a new kind of job to operate alongside them, supplying the types of roles Babcock requires by rethinking the way it does things.

When applying for the role, PSOs are not required to have specific prior experience or skills. Instead, Babcock assesses behaviours and attributes in the selection processes, and then PSOs are trained in the specific skills required to deliver key programmes including Type 31 and other local programmes at Babcock's Rosyth site. Babcock has taken a flexible, holistic approach to recruitment of PSOs, incorporating personalised neurodiversity support as part of recruitment and onboarding and deliberately targeting a diverse cohort, including those not in education, employment or training (NEETs).

This approach has not only proactively addressed the shortage of skilled tradespeople that Babcock struggled with; it has supported local employment opportunities, creating new jobs, skills and progression opportunities. It has also tackled workforce inequality and mitigated local unemployment by providing entry routes for those who otherwise struggle to access the labour market, allowing them to not only get jobs but also gain qualifications to unlock career progression.

PSOs at Babcock, Rosyth

Collectively, these activities to present shipbuilding as a vibrant and inclusive sector with career and job opportunities for all will help to attract and retain a wider variety of people. This will reduce skills shortfalls for shipbuilding by improving the availability of skilled people for shipbuilding employers.

LEVERAGING AND ENHANCING THE EXISTING SKILLS SYSTEM

Skills development is a collaborative effort with individual learners, long term employees, employers, industry bodies and government all having a stake. The UK Shipbuilding Skills Taskforce project has unlocked nationwide, cross-sector collaboration on our skills needs. We have seen examples of employers and education providers working together to deliver skills needed by shipbuilding. But not everyone can access the highest standards of training, which can deter potential recruits and disincentivise employers from investing in skills. Best practice should be brought together, benchmarked and incentivised, through a network of excellence in shipbuilding skills provision. Employers should also draw upon the existing skills infrastructure to make best use of available skills funding across the UK. This requires employers to take a proactive approach to skills, and there are specific actions that the shipbuilding industry can and should embed.

Our Discoveries	Our Priorities	Recommendations for Employers	Recommendations for Educators	Government Support
Shipbuilding skills needs look different in each nation of the UK • Education is devolved, but all four nations are focussed on responding to employer needs, enabling access to good jobs, and growing STEM skills. • Skills needs are different across regions, led by shipbuilding product mixes e.g. leisure, naval, commercial. • Quality of training is not consistent everywhere, and having different systems in each nation creates complexity. This is hard for smaller businesses to navigate and means employer awareness of skills products is a challenge.	**Leveraging and enhancing the existing skills system**	Commit to training the trainer Demonstrate shipbuilding's commitment to skills development through benchmarking initiatives Raise awareness and increase use of the opportunities in the UK skills systems Pledge your commitment to this skills development best practice	Spread best practice by joining a network of excellence in shipbuilding training provision	Convene a network of excellence for shipbuilding training providers to help shipbuilding employers access the skills they need Provide bespoke bootcamp-style investment to support boatbuilding on the south coast of England

The challenges

In the UK, we have had a patchy history of prioritising and deprioritising investment in our skills infrastructure. Furthermore, education is nowadays a devolved matter, with each nation having control over how its skills system is managed and further devolution of some parts of skills policy to local areas in England. This means that policy is diverging rather than converging, which is complex to navigate, particularly for small and medium enterprises. Whilst the skills system is better able to respond to local and regional skills needs, there is also a layer of complexity for businesses trying to use the system to attract, recruit, train and retain potential employees of all ages, as well as upskill their existing workforce.

Small and medium sized enterprises are the backbone of our industry but often struggle to access the skills system. Challenges they face include a difficulty finding the right colleges or training providers, resources for training, and being too small to take on the risk of recruiting and administering apprentices. Discussions with small and medium enterprises in the leisure boatbuilding industry highlighted the following challenges in delivering apprenticeships, which are consistent with the challenges reported by small and medium enterprises in other sectors, including:

- No bandwidth or resource to deliver the administration and mentoring required to support an apprentice;
- Lack of a college or training provider close to their business that would deliver the off-the-job training;
- Unable to afford taking on an apprentice;
- Would like to take on an apprentice but aren't sure of what is involved;
- An apprentice cannot or will not be able to contribute to the business immediately but a skilled workforce is needed now, not in several years' time;
- Cannot run the risk of training an apprentice only for them to then leave; and
- Apprentices would need to spend too much time in college or with their training provider.

The opportunities

The different skills infrastructures within each nation of the UK (and then regionally where there is further local devolution) create additional challenges for national employers, but overall, moves to align training more closely with local industry skills needs are welcome. Our Taskforce project better enabled cross-UK collaboration on skills requirements and created an opportunity to highlight synergy between systems, learn from best practice UK provision, and work together on shared challenges. All four nations have committed to responding to employer needs, enabling access to good jobs, and increasing the supply of STEM skills. It is imperative that education and training providers work collaboratively with employers to ensure high-quality training that consistently meets employer needs is accessible across the UK.

We recognise that once people commit to a career in shipbuilding, it is imperative they have a high-quality, stretching and enriching training experience that gives them the right skills to be effective in their role from day one. This is key to sustaining the message that a shipbuilding career will be rewarding and filled with opportunity.

Our priority: Leveraging and enhancing the existing skills system to ensure a strong pipeline of skilled workers

Our recommendations have two strands. We firstly call on the government to take action to enhance the current skills system so that it works better for shipbuilding. Secondly, we call on industry to take action to leverage the current UK skills system and ensure shipbuilding maximises the opportunities on offer.

Enhancing the skills system: The case for uniting best practice

We feel it is clear that the strong skills pipeline required for shipbuilding to be globally competitive and at the cutting edge of innovation rests on an excellent training provider base. Across the UK, there are pockets of elite best practice in supplying the skills we most need. This is largely driven by local partnership with employers, and enables those employers with sufficient reach, networks and capacity to train enough new recruits each year in the disciplines they require. For smaller businesses, or those less established in the skills system, it is often more challenging to get the training they need for their workforce, but working with supportive and innovative training providers can transform their experience.

We believe that provider best practice should be highlighted, rewarded and disseminated, so that shipbuilding employers can easily access the best training for their staff, know which institutions to seek recruits from, and drive course content. This will also enable learners seeking a career in shipbuilding to know where they can receive the best training and cement a positive perception of the sector.

MTEC: Marine Technology Education Consortium

MTEC is a consortium of three leading UK universities recognised for their excellence in marine technology education and research: Newcastle University, the University of Southampton and University College London.

MTEC offers flexible postgraduate training designed for graduates working in the marine industry. Students can choose to study for an accredited MSc, a Postgraduate Diploma, or a Postgraduate Certificate. Many modules can also be chosen on a standalone basis as part of continuing professional development.

Modules span one week and consist of a combination of distance learning and onsite lectures. This results in minimum disruption to work responsibilities.

A main goal of MTEC is to allow flexibility for study, to minimise disruption in the workplace. This allows students to choose the stream most suited to their employer's needs. This innovative training programme offers a range of modules which you can combine to achieve degree awards.

The MTEC programme provides students with advanced technical and managerial skills, which enhance innovation and business competitiveness. Students learn about new and emerging technologies alongside business and management applications.

The programme provides students with practical, flexible, supported training leading to recognised qualifications with minimum disruption to work. It allows students, and their employers, to choose the stream most suited to their needs.

A Virtual Learning Environment (VLE) is used as a web-based course delivery and management system, allowing students remote access to learning material before in-person lectures.

An MTEC student performs research from the aft of Newcastle University's research vessel, the Princess Royal

Educating future shipbuilders at City of Glasgow College

City of Glasgow College, Scotland's largest College, sits in the heart of Glasgow, surrounded by centuries of Scottish shipbuilding and maritime heritage. Its world class maritime and STEM campus situated on the banks of the River Clyde educates seafarers worldwide. It is upskilling Scotland's world-famous engineering community, working closely with multiple industrial partners to provide an annual pipeline of skilled talent for the Scottish and UK economies. It trains around half of all Merchant Navy cadet officers in the UK.

This super-college works in close partnership with BAE Systems to design, develop, and deliver an innovative, practical, and vocational curriculum for future shipwrights. Working in symbiotic partnership with industry, it restored and updated its shipbuilding HNC/D programme. This educator and industry collaboration ensures that skills provision remains relevant and flexible to meet future needs.

This partnership is evidence-based and analyses the current skills gaps in the industry, to shape the content of the National Progression Award (NPA) in Engineering, through which senior phase (year 4 - 6) school pupils study and learn practical and theoretical shipbuilding craft skills, aligning them to craft apprenticeships pathways. Starting from 2022/23, these courses supply a steady annual stream of 150 skilled craft technicians, with flexibility to increase that number. In the first year of delivery, the NPA award has helped 11 young people secure a full apprenticeship with BAE systems. Further links will see improved articulation into graduate apprenticeships, strengthening BAE's skilled technical and professional workforce.

Those involved in the project have nothing but praise for its outcomes: Glen Anderson, an NPA holder, said his experience "has completely changed my life", while Katie Jordan, Curriculum Head for the NPA noted that "the positive effect this program has had on the young people has been outstanding".

Left: An NPA workshop; right: the beginning of an NPA shipbuilding project

Recommendation: Government should convene a network of excellence for shipbuilding training providers to help shipbuilding employers access the skills they need.

Collaborative action has been key to our project. **We recommend that the government formally convenes a network of excellence for shipbuilding training providers from across the UK.** This should have clear criteria for quality of training and employer support and collaboration, so participating institutions can access additional resources and share best practice. This will enable shipbuilding employers to know where they can access the best training for their staff and drive course content in line with their practices, supporting the National Shipbuilding Strategy Refresh ambition to improve the quality of skills provision. **This approach will assist smaller organisations in particular, who need supportive, collaborative providers for apprenticeships and other training to merit their investment.**

Support from educators: Join this network to spread best practice. The network of excellence will only succeed if educators are on board. To be part of this network, colleges, training providers, Higher Education and research institutions should demonstrate a track record of supporting small and medium enterprises to navigate skills systems across the UK, enabling these smaller organisations to access skills development opportunities and grow their future workforce. This approach will also help learners to easily find high quality education with clear links to employers and careers, driving social mobility and supporting the government's levelling up agenda.

The criteria for educator participation should include:

- Demonstrable commitment to collaboration with employers to ensure training mirrors industry practice and use of the latest technologies;
- The ability to support smaller organisations to navigate the skills and apprenticeships system;
- High-quality continuing professional development for teaching staff to maintain cutting-edge knowledge;
- Excellent marine facilities;
- A strong track record of progression from training into jobs; and
- Capacity to collaborate and share expertise.

Falmouth Marine School: Green skills

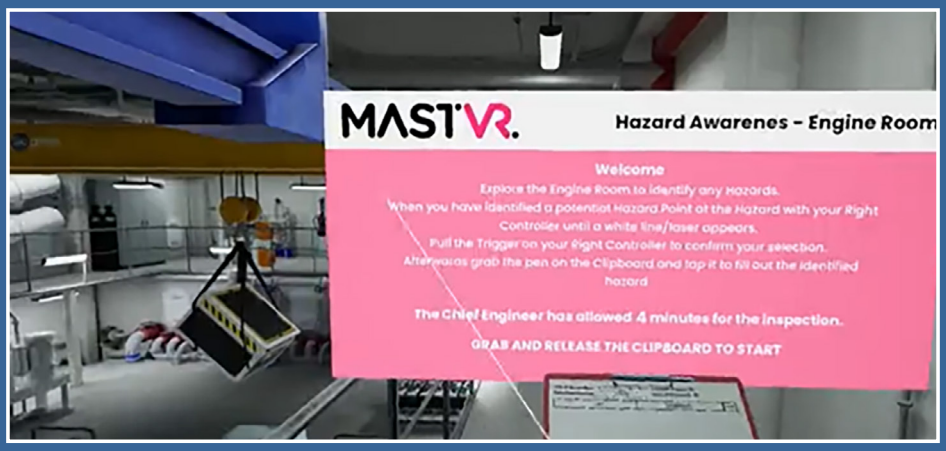
Falmouth Marine School in Cornwall provides a range of courses to prepare students for careers in boatbuilding, leisure and water sports, marine engineering, and marine science. The school has recently been awarded £320k from the government's Strategic Development Fund to develop training and skills to help decarbonise marine vessels.

The school has used this funding to buy equipment and develop course content to train students in the conversion of diesel engine boats to electric propulsion, which will help the sector transition to net zero, faster.

As part of this, the school has developed virtual reality software to help embed learning. 16 new apprentices started a Marine Electrical course in September 2022, and if that goes well, the school will recruit another 16 to start in September 2023.

The school also ran a careers event in March 2023 to link up students with local businesses and employers who increasingly require green skills. One exhibitor said, "I wanted to drop you a note to thank you profusely for the invitation to your event. I found it very informative, and more importantly inspiring to see Falmouth Marine School taking such a proactive stance in this field and collating industry representatives to collaborate and work on such an important subject."

Courses like this will increase the number of qualified engineers with the skills to upgrade maritime vessels, and also the recruitment pool of people to work in offshore wind.



Virtual Reality training: Engine room hazards

Enhancing the skills system: Taking action to address small and medium enterprise needs

Recommendation: Provide bespoke bootcamp-style investment to support boatbuilding on the south coast of England.

As mentioned above, there are significant challenges for small and medium enterprises to access the skills they need, and we think more could be done to support them. Taskforce members are collaborating to develop a specific solution to support smaller boatbuilders on the south coast of England, to be delivered in Portsmouth and provide an additional pool of trained potential recruits. In this area there is a concentration of smaller boatbuilders who find it particularly difficult to access people with the right skills to support their needs.

We are working with industry and educators to develop a British Marine Academy pilot to provide upfront, intensive training with a pathway to an accelerated boatbuilding apprenticeship. If there is demand for a similar approach in other regions across the UK, this model could be rolled out elsewhere. **Additional investment is sought from government to enable initiation of this pilot programme and our proposal is outlined below.**

The British Marine Academy Proposal

A training scheme, under the banner of British Marine Academy, building on both the delivery knowledge gained from Skills Bootcamp and Kickstart models.

This training would be of 16 weeks duration, where entrants to the industry will obtain a broad foundation of marine skills, certifications essential to the operation of yards, and employment experience in an industrial setting.

Academy recruits would be paid National Living Wage for their training period, and their training undertaken in Portsmouth Naval Base Property Trust's Boathouse 4 in Portsmouth Historic Dockyard, delivered by South Devon College.

This course will attract into the industry individuals who would not have otherwise committed to extended training programmes, and who on completion of their course will be of immediate use to employers.

It will deliver 500 hours of guided learning in a condensed fashion, meaning that the training burden is eased for small and medium-sized organisations.

The training programme has been developed in collaboration with industry to respond to areas of need:

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Introduction, Course Overview & Boat Ride	Vessel Types and Basic Industry Understanding	Health & Safety Training	Boat Handling	RYA Level 1 Powerboat
Week 2	Fire Fighting / Extinguisher Training	Health & Safety Training	RYA Essential Navigation and Seamanship Course	RYA Essential Navigation and Seamanship Course	SITE VISIT
Week 3	Forklift Training	Forklift Training	Forklift Training	Forklift Training	Forklift Training
Week 4	MEWP Training	Health & Safety Training	First Aid	First Aid	SITE VISIT
Week 5	Boat & Yacht Maintenance	Boat & Yacht Maintenance	Boat & Yacht Maintenance	Boat & Yacht Maintenance	Real Work / Application of Knowledge
Week 6	Rigging / Rope work	Rigging / Rope work	Rigging / Rope work	Real Work / Application of Knowledge	SITE VISIT
Week 7	Engine Installation & Maintenance	Engine Installation & Maintenance	Engine Installation & Maintenance	Engine Installation & Maintenance	Real Work / Application of Knowledge
Week 8	Sales Training	Sales Training	Sales Training	Sales Training	SITE VISIT
Week 9	Joinery & Woodwork Skills	Joinery & Woodwork Skills	Joinery & Woodwork Skills	Joinery & Woodwork Skills	Real Work / Application of Knowledge
Week 10	Digital Marketing	Digital Marketing	PR & Marketing	PR & Marketing	SITE VISIT
Week 11	Antifouling, Painting & Finishing	Antifouling, Painting & Finishing	Antifouling, Painting & Finishing	Antifouling, Painting & Finishing	Real Work / Application of Knowledge
Week 12	Real Work / Application of Knowledge	Real Work / Application of Knowledge	RYA Level 2 Powerboat	RYA Level 2 Powerboat	SITE VISIT
Week 13	Marine Electrical systems	Marine Electrical systems	Marine Electrical Propulsion	Marine Electrical Propulsion	Real Work / Application of Knowledge
Week 14	Customer Service	Customer Service	Customer Service	Customer Service	SITE VISIT
Week 15	GRP Manufacturing	GRP Manufacturing	GRP Manufacturing	GRP Manufacturing	Real Work / Application of Knowledge
Week 16	Real Work / Application of Knowledge	Real Work / Application of Knowledge	Real Work / Application of Knowledge	Real Work / Application of Knowledge	FINISH and PARTY

The proposed British Marine Academy training programme

Financial support is sought from government to enable initiation of this programme to support south coast boatbuilders.

Leveraging the skills system: Best practice for shipbuilding employers

As set out in the introduction to this report, a key objective for our work as a Taskforce was to 'leverage funding opportunities to their full potential'. Alongside these recommendations for how government should enhance the skills system, there are opportunities within the existing skills system that employers should capitalise on, to maximise shipbuilding's share of government investment.

Recommendation: Employers should commit to training the trainer

In our discovery phase, we found that course content often struggles to keep pace with industry practice. Shipbuilding employers committing to 'train our trainers' is crucial to addressing this. The UK Shipbuilding Skills Taskforce therefore recommends that employers across the shipbuilding industry commit to supporting college and university staff continuous professional development by:

- Offering 'back to the floor' days to enable staff from education and training providers to remain well aligned with the reality of working in the sector;
- Offering staff as guest lecturers in colleges and universities.

Industry should see this as integral to its corporate social responsibility and skills strategy.

We also call on employers to promote the opportunity of becoming teachers in colleges or universities to shipbuilding staff who may be seeking a career change. We know that more people than ever before have left, or are thinking of leaving the broader labour market, and this is a way to retain or retrieve specialist industry knowledge, while strengthening the training pipeline. We recommend that shipbuilding employers engage with the schemes designed to support this, such as Taking Teaching Further in England, the Knowledge Transfer Programme in Wales and Knowledge exchange and curriculum development in Scotland. These all offer opportunities for employers to collaborate with their local further and higher education institutions and research institutes to bring training to life, making the link between training in key shipbuilding skill areas and career opportunities. This will have huge benefits for shipbuilding. It will improve the quality of training, ensuring cutting edge industry practices are taught, and strengthening the shipbuilding training workforce. It will also provide new opportunities to share knowledge and skills for people considering a career change or retirement, retaining and repurposing more of our expertise and talent.


H & W
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Artemis
TECHNOLOGIES
SEAHORSE

Tutor-Industry Partnerships at South Devon College

South Devon College is a key training provider delivering the shipbuilding skills needed by employers in the south west. It has a dedicated marine academy on the banks of the river Dart, with state-of-the-art facilities to train students in a range of courses including apprenticeships, short courses, further education qualifications and degree-level programmes.

It has used a tutor-industry partnership programme to bring industry further into its provision and harness the knowledge of the shipbuilding workforce. Experts from Princess Yachts were paired with trainee Marine Engineering teachers to share the latest vocational knowledge and skills. Teachers were able to visit the facilities at Princess Yachts to see where their apprentices work, the activities they undertake and the techniques they learn. This directly informed course content and made it easier for teachers to relate their classroom teaching to real-life industry application.

Industry experts also took part in guest teaching and developed greater insight into the world of education and the curriculum taught to students on relevant courses.

100% of participants agreed that they had developed stronger links with industry or college staff as a result of participating. The programme is a best practice example of how to 'train the trainer'; it built a foundation for continued collaborative working and promoted teaching as a career pathway to sector experts.

A South Devon College Women into Maritime event, where industry experts share experiences with students

Recommendation: Demonstrate shipbuilding's commitment to skills development through benchmarking initiatives

Shipbuilding employers invest hugely in people, skills and training, and we can do more to promote and celebrate this. Demonstrating our commitment to our workforce is integral to the renewed image of the sector that we want to raise awareness of. We are a high-tech, highly skilled industry, one that is willing to invest in its workforce and be an active participant in the skills system.

We recommend that employers evidence their continued commitment to skills and training through engagement with organisations and 'badging' schemes that demonstrate this commitment and underpin our recommendations. There are a number of such initiatives that more shipbuilding employers should put themselves forward for, which include but are not limited to:

- The 5% Club[15];
- Investors in People[16];
- The Top 100 Apprenticeship Employers and Top 50 SME Apprenticeship Employers[17];
- The regional and national Apprenticeship Awards[18];
- Fair work[19].

[15] *https://www.5percentclub.org.uk/*
[16] *https://www.investorsinpeople.com/*
[17] *https://www.topapprenticeshipemployers.co.uk/*
[18] *https://appawards.co.uk/*
[19] *https://www.gov.scot/publications/fair-work-first-guidance/*

Berthon Boat Company Ltd: Gold 5% Club Member

Berthon Boat Company has employed apprentices for more than 100 years. Having this longstanding, mature programme has ensured it has the right skills in the right place and at the right time to service the needs of its customers, which span multiple disciplines in the differing sectors of leisure marine and small commercial vessels.

Berthon decided to join the 5% Club as it is the kitemark for employers who undertake 'earn as you learn schemes' in the UK, promoting the aspiration for businesses to achieve 5% of their workforce in earn and learn positions. Berthon sees promotion of workplace learning as vital to securing the workforce it needs now and in the future.

Berthon's apprenticeship programme is the bedrock of skills development within its company, so the 5% Club membership criteria aligns with its aims to not only have a high-quality scheme of its own (which forms 15% of current full-time employee numbers), but also promoting apprenticeships across the marine sector as well as across the educational sphere.

Berthon also supports other schemes and programmes that feed into its annual audit by the 5% Club. These include internships and summer work placements for university students, work experience for schools and sixth-form colleges, as well as 'Teacher Encounters' and 'back to the floor days' for educators.

Berthon continually invests in the next generation and is proud to be a Gold member of the 5% Club. Being a Gold member provides external benchmarking and validation for Berthon's investment and values. This helps Berthon take stock of its position each year and focus on where it can improve and develop its programme further.

Gold membership is also a visible stamp that helps promote Berthon's programmes and the wider shipbuilding industry, to showcase career opportunities and attract, train and retain a highly skilled workforce.

Berthon apprentices at work

Recommendation: Raise awareness among shipbuilding employers of the opportunities in UK skills systems

Across the UK, skills systems rely on proactive engagement by employers to shape the content of training, share industry knowledge and practice, and try and test initiatives that aim to address their needs. There are a number of programmes that incentivise and embed this, which we recommend shipbuilding employers capitalise on.

Summary of UK skills systems. Additional details are at Annex B

The South Coast Institute of Technology – Building Talent Together

Backed by over £13 million in funding from the Department for Education, the South Coast Institute of Technology (IoT) has been created to increase technical training opportunities in Maritime, Engineering and Digital industries. The South Coast IoT is a regional training hub made up of existing providers working together. It is a collaboration of two universities and five FE colleges, which will deliver a wide range of flexible post-16 technical education including: T Levels, Higher Technical Qualifications, Apprenticeships, Degrees, and Professional Qualifications. These courses will skill, reskill and upskill learners for a wide range of exciting maritime career pathways, including naval architecture, boatbuilding, engineering, technology, and business.

There is a significant shipbuilding knowledge and skills shortfall in the Solent region, where there is an ageing population and too few people choosing to enter the industry. This problem is further inflated with the ambitious growth forecast for the region fuelled by the Solent Freeport and Solent 2050 strategy.

The IoT's goal is to collaborate, inspire, and deliver real-world learning that prepares students for careers in the maritime, engineering, and digital industries. Collaboration is at the heart of the business. It is working closely with education providers, careers services and public sector organisations to create coherent career pathways which align with initiatives such as the Local Skills Improvement Plan (LSIP) and the Solent Cluster, which is committed to finding solutions to help the UK move to net zero. The IoT is supported by major employers in the region such as the Royal Navy, Portsmouth International Port, and Maritime UK Solent.

The South Coast IoT is starting to work with primary and secondary schools to inform teachers, students, and their parents about the plethora of opportunities in the maritime industry and inspire students to live, study and work locally in these high demand careers.

In September 2023, over 1,400 new students will commence courses that feed into one of 28 maritime, engineering, and digital career pathways. All of the courses are aligned to professional standards written by employers. Students will hone professional skills such as a hard work ethic, problem solving, resilience and good communication skills and gain specialist knowledge and skills in areas such as advanced materials, advanced manufacturing, computer aided design and modelling, emerging technologies, alternative fuels, data analytics, artificial intelligence, and robotics.

SOUTH COAST INSTITUTE OF TECHNOLOGY

We know that it can be hard to know where to start, particularly for small and medium-sized employers, so we want to help the sector to increase its outreach in schools and use of the skills system. **To bring education and industry closer together, we are establishing a 'toolkit' for both employers and educators.** This is especially aimed at helping smaller organisations with less resource to identify ways they can utilise the skills systems across the UK and establish relationships with local education providers, who will be able to support employers to shape course content to meet their needs and assist with supporting their employees as they complete their training.

Recommendation: Employers should pledge commitment to skills development best practice

This chapter detailed a number of ways that shipbuilding employers can leverage the UK skills system to increase the availability of skilled workers and support improvements to the quality of training. **We ask shipbuilding employers to pledge their commitment to skills development and show government, educators and the next generation of workers that we will work in partnership to sustain and grow our industry.**

ENSURING SHIPBUILDING SKILLS ARE FIT FOR THE FUTURE

Skills Foresighting must be initiated to identify the skills, knowledge and behaviours that have the greatest potential to boost productivity improvements and increase the competitive advantage of UK shipbuilding. This will help industry plan well into the future, allowing more rapid adoption of new processes and creating an environment of continuous improvement. It will also enable development of short courses in key, emerging skills, that can be used to pilot a microcredentials approach to reskilling and upskilling, with a view to broader rollout. Adopting a pro-innovation culture that can take advantage of the latest technology and rapidly upskill to unlock the benefits innovation can offer will also be key to our success.

Our Discoveries	Our Priorities	Recommendations for Employers	Recommendations for Educators	Government Support
The sector will need to respond to changing skills needs and emerging technology • Skills systems are not agile enough to rapidly respond to technological change. • A culture that supports reskilling and upskilling will be essential; behaviours and processes are just as important as skills. • Skills demands will fluctuate over time, driven by changes in market demand and new technologies.	**Ensuring shipbuilding skills are fit for the future**	Engage with Skills Foresighting for shipbuilding Pilot a microcredentials approach to training in advanced manufacturing technologies	Collaborate with governments and employers to make learning more flexible and modular to support upskilling and reskilling	Make systems that allow for more flexible and modular learning, to more rapidly respond to the needs of employers

The challenges

Our work has identified key areas that will dominate future skills requirements, namely: advanced manufacturing, data analysis, digital twins, communications, energy generation, green shipping, alternative fuels, virtual reality, robotics, AI and quantum technologies. These are growth areas across UK STEM industries, which are already directly competing with shipbuilding to recruit skilled people.

The case for Skills Foresighting

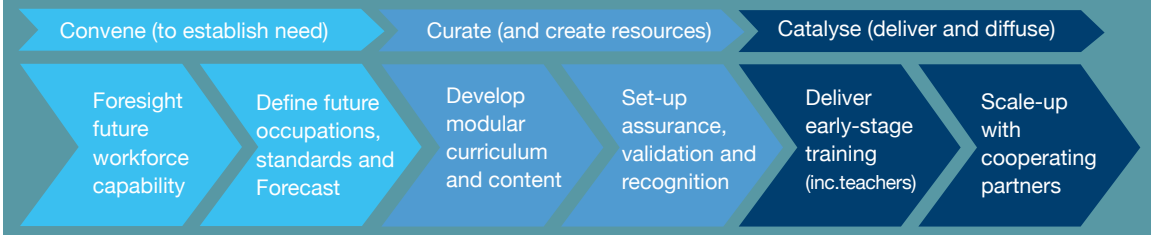
We believe that a formal Skills Foresighting project is needed to identify the skills required to rapidly adapt to and exploit the new technologies that will drive improved productivity and competitiveness for shipbuilding. Skills Foresighting enables a sector to predict the skills that will be needed as it adopts new technologies and processes and identify the gap between current skills provision and future skills needed to future-proof their work. We see Skills Foresighting as essential to allow shipbuilding to unlock the benefits innovation can offer.

What is Skills Foresighting?

Skills Foresighting is the first stage of a skills value chain, which involves foresighting future workforce requirements by identifying the 'future state' competencies necessary to enable industry to adopt and exploit emerging technology capabilities, such as industrial digitisation. These future workforce competencies can then be evaluated against the known 'current state' and subsequent recommendations for timely action to prevent future skills shortages can be made. The process uses a framework of structured discussions, workshops, analysis and evaluation to propose changes to standards and qualifications as well as future education and training provision at all levels.

Learning from Skills Foresighting for electrification in the automotive sector

Foresighting future skills needs is a key recommendation from the High Value Manufacturing Catapult's 'Manufacturing the Future Workforce' report[20]. The report proposes using the Skills Value Chain to show how activities that connect technology change and workforce development are related and interdependent, all requiring a systematic approach to their delivery. The automotive sector was part of the pilot activity and took part in a series of workshops and analysis during the Emerging Skills Projects on a number of digitalisation and electrification subjects.



A diagram of the Skills Value Chain methodology

The aim of the pilot and project was to create a 'line of sight' from technology innovation to workforce skills, from strategy to classroom, to enable successful UK electrification scale-up and equip today's trainers to deliver the skills of tomorrow.

This was particularly key in the context of electrification, as part of the move away from internal combustion engine-powered cars to hybrid and battery-powered vehicles resulted in the need to reskill large parts of the existing workforce in the sector.

The outcome of the Foresighting process is a series of open access two- and three-day units. These can be delivered by training providers and employers across the country, either online or face to face, by trainers who have been given the skills and knowledge to deliver these new courses as part of the process.

To date, these units have been deployed as modules to support apprentice learning as well as short courses. In parallel, the Gatsby Foundation supported the creation of an associated trainer development programme, which continues to grow and provide peer group and professional support.

The work to date on identifying the future skills requirements as a result of electrification will feed into the National Electrification Skills Framework and Forum[21], which is being developed by a consortium including Enginuity, Coventry University, Warwick Manufacturing Group and UKBIC to enable the UK workforce to meet the challenges of the electric revolution. This will cover all sectors, including shipbuilding.

[20] *https://hvm.catapult.org.uk/wp-content/uploads/2022/06/Manufacturing-the-Future-Workforce-Full-Report.pdf*
[21] *https://hvm.catapult.org.uk/wp-content/uploads/2021/11/National-Electrification-Skills-Forum-Brochure-FINAL.pdf*

The need for agility in reskilling and upskilling

The Industrial Strategy Council's 2019 research paper, 'UK Skills Mismatch in 2030', highlighted that 80% of the 2030 workforce is already in work[22]. When considered alongside the World Economic Forum 2020 findings[23] that by 2025, 44% of the skills that employees need to do their jobs will have changed, this suggests that the existing skills supply models of further and higher education will not have the capacity to support the necessary retraining of the existing workforce, alongside training new entrants, to enable rapid response to technological change.

This reality, coupled with the expected variations in demand for shipbuilding skills (driven by both market needs and innovation), means shipbuilding will need to take an adaptable and flexible approach to future training. This will be integral to remaining globally competitive and adopting innovative technologies. The Cumberford-Little report[24] describes the characteristics of a coherent, connected post-school learning system that could provide the agility and flexibility to deliver the workforce we need.

What are microcredentials?

Microcredentials are short courses focussed upon particular skills. They are typically designed to meet specific employer needs, aligned to workplace skills. Microcredentials are being developed rapidly across the world and other sectors are considering how they could benefit their skills practices.

Fundamentally, microcredentials can make it easier for people to reskill and develop a portfolio of skills, giving them greater flexibility in their employment. This can also support employers to build business resilience. Microcredentials have potential to make it easier for people to move between organisations and sectors in response to peaks of activity, better accommodating fluctuations in demand. We see microcredentials as a tool that can unlock innovation, improve productivity, support rapid reskilling and upskilling, and provide a broader talent pool for the sector. They will also provide an accessible pathway for people already employed in the sector to develop their skills whilst continuing to work and earn.

We acknowledge that widespread rollout of microcredentials will be a long-term endeavour, so in the meantime, industry must see partnership with education and training providers as integral to its future strategy. Likewise, education and training providers must see partnership with industry as integral to their strategy, to build the skills of tomorrow.

Our priority: Ensuring shipbuilding skills are fit for the future

Recommendation: Foresighting changing skills for shipbuilding

To address the National Shipbuilding Strategy Refresh ambition to complete Skills Foresighting for the shipbuilding sector by 2024, we are collaborating with the National Manufacturing Institute Scotland on Skills Foresighting. Our initial focus is advanced manufacturing for productivity. We used the National Shipbuilding Strategy Refresh and our own research to identify technologies that are already at a relatively high level of development (i.e. in mid to high Technology Readiness Level) and concluded that advanced manufacturing will enable the shipbuilding sector to achieve the greatest benefit at pace.

Foresighting will identify future workforce skills requirements linked to advanced manufacturing and show gaps in current skills provision. This will allow us to highlight where new standards, qualifications and upskilling courses are required

[22] *https://industrialstrategycouncil.org/sites/default/files/UKSkillsMismatch2030*

[23] *https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf*

[24] *https://view.pagetiger.com/inlhij/1/PDF.pdf*

for the current workforce. This approach will enable shipbuilding employers to use the outputs of Foresighting to initiate subsequent work to look at the content of apprenticeships, academic qualifications and other training to fill any gaps in existing training provision, in line with the key knowledge, skills and behaviours that the process showed will be needed in future.

Recommendation: Shipbuilding employers should pilot a microcredentials approach to training in advanced manufacturing technologies

Employers play a critical role in upskilling their workforce to adapt to changing technology and industry landscapes, at the same time promoting the long-term success of their organisations. As changes occur, some job roles may become obsolete or require significant adaptation and employers play a vital role in supporting their employees to upskill during these periods of transition.

We believe that upskilling and reskilling needs can best be met by modular training and learning-through-work approaches. **We recommend that following Skills Foresighting, shipbuilding employers work with the National Manufacturing Institute Scotland and their Skills Academy to pilot a microcredentials approach to support the existing shipbuilding workforce to upskill in advanced manufacturing techniques, with a view to subsequent wider, industry-led rollout.**

This approach should be developed by-industry for-industry, although to endure in the long term it must be aligned to government-backed training and education frameworks.

Development of microcredentials would come at a cost and would need to be funded. They should also be considered in the context of the transformation of the student finance system at levels 4 to 6 that the Lifelong Loan Entitlement[25] will introduce in England from 2025. If industry takes up this recommendation, employers should work together to identify sources of funding to create, accredit and assure microcredentials. There may be opportunities to partner with industry bodies in this endeavour.

Support from educators: Collaborate with government and employers to make learning more flexible and modular, to support upskilling and reskilling. Initially we envisage the content developed by the National Manufacturing Institute Scotland for shipbuilding employers will demonstrate the utility of a microcredentials approach to upskilling and reskilling. Educator engagement will be needed to disseminate this approach across the UK. As more content is developed over time, consensus on the skills framework will be needed to support the wider rollout of microcredentials and a mechanism must be established to ensure this is kept up-to-date and qualifications are recognised across the UK shipbuilding industry. There is also a need to agree how training can be delivered in a streamlined and efficient way. Educators from across the UK will play a key role in this activity, collaborating with both governments and employers to make this vision a reality.

Support from government: Make systems that allow for more flexible and modular learning, to more rapidly respond to the needs of employers. We recognise new content and scale-up of provision will be required as skills demands evolve in response to technological change and diffusion. We recognise that the existing skills system across the UK does not always adapt rapidly to meet the needs of employers as they are adopting new technologies. We also feel that the current skills system does not adequately cater for different learning styles and neurodiversity. To change this, we feel that governments across the UK must also go further, and make learning more flexible and modular so the skills system can more rapidly respond to the emerging skills

[25] *https://www.gov.uk/government/consultations/lifelong-loan-entitlement*

needs of employers and meet a broader range of learner needs to support people to upskill and reskill throughout their careers. This will require continued engagement with the sector.

Current funding mechanisms across the UK should also be reviewed and where necessary adapted to ensure modular and flexible training can be accessed. We feel employers who pay into the apprenticeship levy should be able to use levy funds to contribute towards the costs of upskilling and reskilling their existing workforces and be able to pass on funds to their supply chain to do the same.

SHIPBUILDING SKILLS NEXT STEPS

We have been committed to taking the whole industry along on our journey. That's why we established a dedicated phase for engagement, to follow publication of our report. Until December 2023, we will continue working with industry to make the case for our recommendations and encourage radical action. We will also work with government to make the case for continued investment in our skills needs and the interventions we have called for.

Our call to action: For industry, by industry

1. Continue to collaborate through an industry-led group to champion UK shipbuilding skills needs and deliver our recommendations.
2. Help promote a new narrative for our sector and take action to attract and retain the future workforce in a competitive environment.
3. Take a collaborative and proactive approach to skills development by training the trainer, demonstrating our commitment to skills, and leveraging UK skills systems using our toolkit. Go further by pledging your commitment too.
4. Engage with Skills Foresighting and pilot a microcredentials approach to training in advanced manufacturing technologies.

Our call to action: Government support to shipbuilding across the UK

1. Support and facilitate an industry-led group to represent shipbuilding's skills needs and implement our recommendations.
2. The National Shipbuilding Office should coordinate an industry-led campaign to promote shipbuilding career opportunities, using the new narrative for the sector developed by industry.
3. Education departments across the UK should bring together best practice in shipbuilding skills training by establishing a network of excellence, with clear criteria for quality and employer collaboration, so participating institutions can access additional resources and share best practice.
4. The Department for Education should provide bespoke investment to support boatbuilding on the south coast of England.
5. Education departments across the UK should prioritise and promote vocational education through more flexible and modular delivery methods.
6. Commit to the delivery of the 30-year pipeline and prioritise UK shipbuilding in procurement programmes.

Our ask of educators

1. Continue collaborating closely with shipbuilding employers to develop skills for shipbuilding.
2. Help to promote shipbuilding careers, using resources like the maritime futures curriculum.
3. Spread best practice by joining a network of excellence in shipbuilding training provision.
4. Collaborate to make training more flexible and suited to learner and employer needs to support upskilling and reskilling.

Collectively, we believe that taking our recommendations forward will support the UK shipbuilding industry to reduce skills shortfalls and improve skills availability and quality. Our proposals will also assist UK shipbuilding to better align workforce skills with technology and productivity opportunities, allowing more rapid adoption of new processes and creating an environment of continuous improvement.

Our Vision for the Future of Shipbuilding Skills

Our vision for the future of shipbuilding skills is one of collaboration and opportunity. There will be a greater awareness of careers in shipbuilding to give the sector a skilled workforce that is fit for the future, and able to utilise new and emerging technologies.

COLLABORATION

We want to continue our collaborative government and industry approach to champion UK shipbuilding skills needs. Having a skilled workforce will drive competitiveness, supporting UK shipbuilding to secure global export orders, creating further opportunities for investment in skills.

AWARENESS

We want people across the UK to know shipbuilding is increasingly high-tech, sustainable and inclusive, and inspire a diverse range of people to pursue careers in the sector.

OPPORTUNITY

We want our innovative sector to leverage the skills systems across the UK to offer a wide range of opportunities in high skill, high wage roles.

FIT FOR THE FUTURE

We want to enable individuals to develop their skills and keep pace with technological changes. The sector's commitment to skills development will support industry to utilise emerging technology, as well as drive productivity and economic growth. This will allow the sector to be at the forefront of shipbuilding technological and environmental innovations that have the potential to improve UK shipbuilding export performance and meet our ambitious net zero targets.

Annex A: UK Shipbuilding Skills Taskforce Terms of Reference

Objectives of the Taskforce

The UK Shipbuilding Skills Taskforce (UKSST) has been established to develop and implement a future-focused skills strategy for shipbuilding in the UK. It will operate over an 18-month period and aim to ensure the UK's shipbuilding industry has a skilled workforce both in the short and longer-term.

The Taskforce will:

- deliver a collaborative approach to better understand, articulate and safeguard a fit-for-purpose skills provision for UK shipbuilding
- establish a baseline understanding of the upskilling, reskilling and future skilling needs to support shipbuilding across the UK
- provide solutions and identify interventions to address the identified skills shortfalls for traditional shipbuilding methods, as well as those needed for new and emerging technologies
- use its networks to share ideas and promote best practice to build a strong skills base for UK shipbuilding
- stimulate a wider interest in skills for shipbuilding amongst young people and the associated employment and career opportunities
- consider and address barriers in all four nations of the UK
- promote partnership with providers and training bodies/academics working within the existing UK skills system to leverage greater momentum for UK shipbuilding
- advocate the work of the Taskforce to their networks and the wider sector
- optimise available skills funding and infrastructure to better support UK shipbuilding

As part of Taskforce activities, especially when stimulating wider interest in the industry, diversity and inclusion should be considered, and where possible, actions should be implemented to increase diversity and inclusion within the industry.

The scope of the Taskforce aligns with the National Shipbuilding Strategy (NSbS) and includes the design; build; integration; test and evaluation; repair; refit; conversion; and support of warships; commercial vessels; workboats; leisure vessels; systems and sub-systems. This does not include submarines, although we recognise that there are some overlaps, particularly in terms of skills and the supply chain. Government's approach to the submarine industry is set out in the Defence and Security Industrial Strategy.

Outcomes of the Taskforce

The Taskforce will prepare a future-focused shipbuilding skills strategy by the end of June 2023, with a set of recommendations and a prioritised SMART Action plan to support and enable the UK shipbuilding sector to meet its skills requirements and thereby develop a competitive advantage. The Taskforce will begin to implement the agreed actions during the final six months of the Taskforce's lifespan.

The Taskforce will be instrumental in taking steps to achieve the policy ambitions for skills as set out in the NSbS. The Taskforce will also be essential in supporting the creation of a skilled pipeline of workers needed to deliver the cross-Government 30-year shipbuilding pipeline and growth ambitions for the industry.

Approach of the Taskforce

The work of the Taskforce will follow three distinct phases, with each stage being approximately 6 months in duration:

1. Discovery: the Taskforce will use members' knowledge and networks to draw together a picture of the skills needs and barriers within the industry, and the extent to which existing provision is meeting those needs.
2. Prioritisation: the Taskforce will identify areas of action to address barriers and ensure skills

needs are met into the future. It will consult broadly to ensure proposed activity has the support of the wider sector.

3. Advocacy and engagement: the Taskforce will begin to implement the actions agreed during the prioritisation phase. This will include promoting best practice from other sectors and promoting career and employment opportunities in shipbuilding itself.

The Taskforce will:

- foster an industry-wide understanding of the future workforce requirements to ensure that demand is clearly articulated to the UK skills supply chain
- review detailed analyses of all relevant skills training and their uptake
- propose ways in which greater levels of talent can be attracted to the shipbuilding sector in quantities that meet industry demands
- leverage funding opportunities to their full potential
- support skills development to catalyse new technologies (especially green technologies) to support UK shipbuilding

Commitment to the Taskforce

The first meeting of the Taskforce took place in July 2022. At that meeting these Terms of Reference were agreed and an overview work plan was reviewed.

The Taskforce secretariat records the main discussion and action points from each meeting, to be shared with members within seven days of the meeting (a verbatim record is not required).

Following its first meeting, the UKSST has met monthly, with both in-person and virtual meetings taking place. The aim is for in-person meetings to take place alongside a relevant visit to the sector in locations across the UK. It is anticipated that the final meeting will take place in December 2023.

As part of their role on the Taskforce, members are expected to contribute to distinct workstreams on priority areas. These were established and agreed in the first two meetings.

It is likely activity will still be required after the planned conclusion of the Taskforce in December 2023. The Taskforce should therefore make recommendations for consideration by the Department for Education (DfE) and the National Shipbuilding Office (NSO) on how relevant and incomplete work could continue.

Taskforce members will be expected to:

- actively contribute to all meetings, providing evidence-based advice in their respective area(s) of expertise
- bring their advice, views, constructive challenge and best practice to the meetings, whilst avoiding the promotion of company-specific work or direct conflicts of interest
- frequently consult and inform their organisations and respective networks on the Taskforce's work and bring relevant others' views to meetings
- engage with the Taskforce and government to refine and finalise the policy solutions to be included in the UKSST's final report
- engage in prioritised action planning and engagement once the UKSST Report is agreed
- attend all meetings, whether in person or virtually. If members cannot attend a meeting, they should inform the secretariat and Chair as soon as possible. If members miss more than two meetings, the secretariat and Chair will discuss with the member the reasons for their absence
- be transparent, open and honest about any conflicts of interest throughout the Taskforce's duration. The secretariat will maintain a log of such conflicts.
- approach the secretariat team if they require any support with external communications relating to their work as part of the Taskforce
- uphold the Nolan Principles for conduct in

public life: selflessness, integrity, objectivity, accountability, openness, honesty and leadership

- not share any confidential or controversial items or data discussed at Taskforce meetings outside of the group unless pre-agreed with the secretariat

Taskforce Chair

The Taskforce is chaired by Honorary Captain Dr Paul Little, Principal and Chief Executive of City of Glasgow College.

The Chair will attend the Maritime Skills Commission (MSC) and Shipbuilding Enterprise for Growth (SEG) meetings to represent the Taskforce and ensure alignment with these groups. The Chair will report on the work of the Taskforce to the Shipbuilding Inter-Ministerial Group (IMG) as required.

In addition to the requirements for all members, the Taskforce Chair will:

- chair all Taskforce meetings
- provide leadership to the Taskforce, ensuring it is properly organised, delivers its functions effectively, champions bold thinking, with all members provided with a fair opportunity to contribute
- ensure the Taskforce works collaboratively, and communicates effectively with stakeholders across the shipbuilding enterprise, academia, trade unions and government sectors
- ensure that the Taskforce identifies actions to improve skills shortages, and that all solutions and the relevant evidence base are considered
- ensure the work of the Taskforce remains on schedule to achieve its aims and objectives
- provide regular content and updates for the wider consultative group, to be led by DfE, and take up opportunities for communications and engagement moments with the sector more broadly
- attend weekly meetings with DfE officials to review Taskforce work, progress and risks and agree Taskforce meeting agendas, as well as regular meetings with the Directors of Skills Strategy and Engagement and the CEO of the NSO to update on the work of the Taskforce
- work with the secretariat to produce a report on the work of the Taskforce in real time
- attend other ad hoc events or meetings as and when required, such as the Shipbuilding Inter-Ministerial Group

The Chair's main point of contact in DfE for the secretariat is Hannah Patterson. For any specific issues or questions relating to the NSO, the point of contact is Rue McIlmoyle.

Should the Chair be unable to attend a meeting, the secretariat will invite another member to Chair the meeting.

Taskforce membership

The Taskforce includes a diverse mix of expert members from across the UK, providing coverage from industry (including SMEs and corporates), academia, training providers and trade representative bodies.

Should a Taskforce member's personal circumstances change, they will be asked to discuss this with the Chair and the Taskforce secretariat.

Officials from government departments will attend relevant Taskforce meetings and working groups to provide secretariat support. With the agreement of the Chair, other relevant stakeholders may be invited by government to take part in working group discussions as required.

Government officials will support with coordination, policy thinking and analysis, working with Taskforce members and their organisations.

Representatives from other government departments across all four nations may also be invited to attend on an ad hoc basis, depending

on the topics being discussed. Similarly, the Taskforce may identify individuals to attend to support discussion of a specifically identified matter.

Taskforce governance

The secretariat will monitor the effectiveness of the group in meeting its intended objectives and, with the Chair, frequently review any need to change the structure and purpose of the meetings.

It will regularly provide progress updates via governance structures within the DfE (see overleaf for diagram):

- The Directors for Skills Strategy and Engagement will report on progress to the NSbS Board. This is a cross-Government Directors board which oversees the delivery of Departmental commitments in the NSbS;
- The Chair will attend the Shipbuilding Enterprise for Growth (SEG) meetings to represent the Taskforce and ensure alignment with the group. The SEG is the main interface between government and industry for delivery of the strategy and is co-chaired by Rear Admiral Rex Cox, CEO of the NSO, and John Howie, President of the Society of Maritime Industries;
- The secretariat will be responsible for briefing the DfE Ministerial team on a regular basis in advance of the Shipbuilding Inter-Ministerial group (IMG). Chaired by the Defence Secretary, in his role as Shipbuilding Tsar, it provides Ministerial oversight of the NSbS and the opportunity to expose and resolve conflicting priorities.

Issues and risks will also be escalated in this order. These boards, on occasion, will also invite the Chair of the Taskforce to provide updates.

Taskforce members will be able to raise any issues with the secretariat by contacting officials directly, or via shipbuilding.uksst@education.gov.uk.

Secretariat

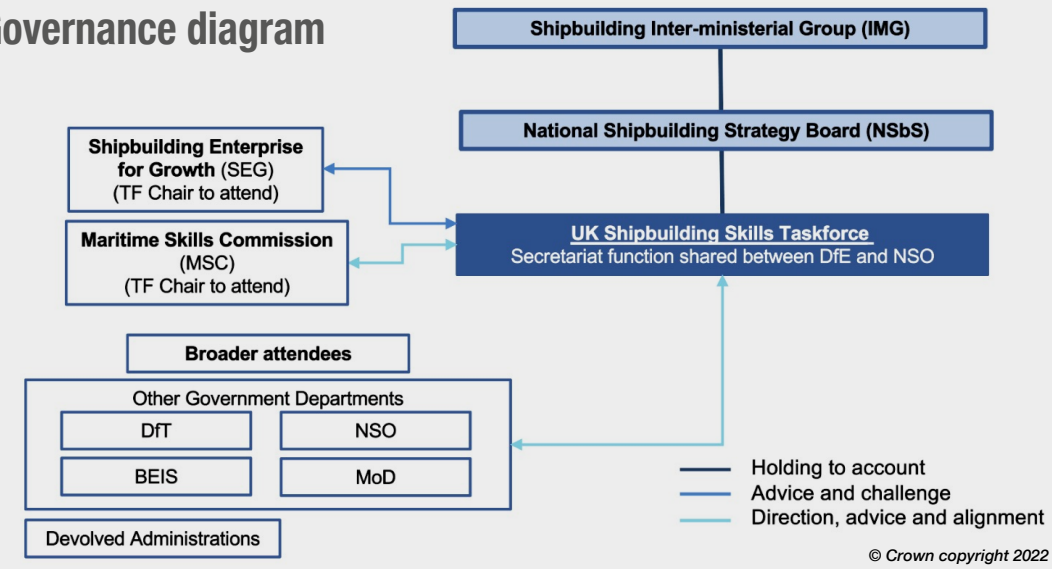
The secretariat function for the Taskforce will be a shared responsibility between the DfE and the NSO. It will be responsible for arranging meetings, circulating papers and recording minutes of meetings, as well as other ad hoc tasks.

Agendas and papers will be circulated at least three working days in advance; minutes will be circulated within one week of meetings.

The secretariat will provide updates to and consult the wider Taskforce mailing list on work when required. Minutes shared outside of the core Taskforce will have any confidential information removed.

The secretariat will also be responsible for maintaining and tracking progress of the agreed workplan and actions.

Governance diagram



Annex B: UK careers infrastructure

In each nation of the UK, there are specific actions employers can take now to improve their careers outreach.

ENGLAND

Careers advice in schools is primarily delivered in partnership with the Careers and Enterprise Company (CEC). The UK Shipbuilding Skills Taskforce encourages shipbuilding employers to become CEC Cornerstone Employers[26], so they can engage directly with schools and colleges, supported by local Careers Hubs. In addition, employers should offer teacher encounters through the CEC, to help schoolteachers understand shipbuilding career pathways.[27] We also encourage industry professionals to join the CEC's network of Enterprise Advisers[28], who support schoolteacher knowledge of business. This will help increase understanding of the opportunities that shipbuilding careers provide and promote the new narrative for the sector.

The National Careers Service (England) provides high quality, careers information, advice and guidance to help people to make informed decisions about their future, and allows them to find out about and consider the different options available to them. It is a free, government funded careers information, advice and guidance service that draws on a range of labour market information to support and guide individuals. It is impartial, and careers guidance is tailored to individual needs, helping customers make informed choices about their career choices whatever their age, ethnic group and background. Careers advisers help customers to be self-aware, helping them to identify their current skills, experience and aptitudes in the context of current and future labour market requirements. They work with customers to agree an individual careers and skills action plan to help people understand what they need to do to achieve their short, medium and long term goals.

The local service is contracted into 9 geographic areas in England (East of England and Buckinghamshire, East Midlands and Northamptonshire, North West, North East and Cumbria, London, South East, South West and Oxfordshire, West Midlands, Yorkshire and the Humber). These organisations deliver face to face and telephone information advice and guidance to adults aged 19+ (or aged 18 if not in education, employment or training) and provide young people aged 13 – 18 careers advice and guidance through the telephone and webchat. The service website gives customers access to a range of useful digital tools and resources to support them including 'Explore Careers' which includes more than 130 industry areas and more than 800 job profiles including a range of key sector careers available, describing what those roles entail, qualifications and entry routes. The content team regularly researches and updates content and welcomes updates from industry to ensure content is accurate and up to date.

The National Careers Service and the Careers and Enterprise Company present information across a wide range of industry sectors, enabling students and customers to understand the broad range of career options and learning routes available to them as they plan, and manage, their career.

A key principle of careers information, advice and guidance is that it works in the best interests of the individual and the National Careers Service and the Careers and Enterprise Company help industry sectors to disseminate key information and updates via bulletins and newsletters to career leaders in schools and colleges and careers advisers in the community. They can also facilitate webinars and question and answer sessions to help careers specialists keep up with developments – this is a joint partnership as it requires input from industry to ensure that content is accurate and up to date.

A specific programme dedicated to the promotion of technical and vocational career

[26] *https://www.careersandenterprise.co.uk/employers/become-a-cornerstone-employer*

[27] *https://www.careersandenterprise.co.uk/employers/teacher-encounters-tools-and-resources*

[28] *https://enterpriseadviser.careersandenterprise.co.uk/becoming-an-enterprise-adviser*

pathways in England is the ASK (Apprenticeship Support & Knowledge) programme, and this is key to working with schools and pupils in raising awareness about sectors. Each year £3.2 million is invested in the ASK programme to increase awareness of apprenticeships and T Levels amongst students, parents, carers, teachers and career advisers. There are ASK delivery partners in all regions that work with employers, schools and pupils to raise awareness of apprenticeships and T levels. For example, ASK provides support to:

- Schools, through free resources to promote apprenticeships, including visiting girls' schools and promoting STEM.
- Students, through giving a free bespoke package of information and support about apprenticeships
- Employers, to promote opportunities in schools.

The ASK programme supports young people from all backgrounds and areas to access apprenticeships across England. Between the 2016/17 and 2021/22 academic years, the ASK programme worked with 5,000 schools and over 47,500 teachers, reaching over 2 million students and over 230,000 parents.

WALES

Employers in Wales should engage with Careers Wales, which provides a range of free services to employers in Wales. This service is supported by Business Engagement Advisers to help employers explore ways they can support local schools and learners.

The Education Business Partnership provides opportunities for pupils, their teachers, and often parents, to meet and interact with employers. It includes employer engagement activities which enrich teaching and learning across all subjects such as discussing job roles, industries and sharing knowledge and experience to give learners insight into the world of work.

The Education Business Partnership School Valued Partner Initiative gives recognition to employers who support individual schools through Careers Wales employer engagement activities. Careers Wales identify employers who have an ongoing relationship and who regularly support activities in these schools (a minimum of 3 activities per year).

The Curriculum for Wales and the integral skills which support them set high expectations to ensure every school learner gains a broad and balanced education, including the skills, preparing learners for careers and work. The Curriculum for Wales places important emphasis on a wide range of learning experiences which businesses are well placed to support. It also encourages and empowers schools to work closely with a range of partners including businesses and employers. Careers and Work-Related Experiences is a cross-cutting theme of the Curriculum for Wales for learners aged 3 to 16.

The Working Wales service provides personalised expert careers advice and employment support. It is a free service available to anyone aged 16 and over living in Wales.

NORTHERN IRELAND

Careers Education is a statutory part of the Northern Ireland Curriculum in schools and is covered in the Learning for Life and Work area of learning. Careers teachers work in partnership with the Department for the Economy's Careers Service. Department for the Economy careers advisors provide professional advice and guidance at key transition points.

Employers in Northern Ireland should engage with the Department for the Economy's Careers Service's Careers Occupational Information Unit, which provides emerging, localised, up to date careers messaging across a range of key sectors. This work involves engagement with key strategic partners (including the Advanced Manufacturing and Engineering Sectoral Partnership) and draws upon statistical information provided by the Department for the

Economy's economists. Importantly, this work provides a vehicle for the sector itself to set out key messages on industry needs. All digital bulletins are available to schools, students, parents, careers advisers and citizens.

Sectoral Partnerships are employer-led bodies, comprised of various stakeholders, including Further Education and Higher Education representatives, trade unions and industry experts to help develop new, and review the content of Traineeships, Level 2 and 3 apprenticeship frameworks and Higher Level Apprenticeships from Level 4 to 7. Employers are encouraged to engage with their local partnership.

SCOTLAND

Skills Development Scotland is committed to working with employers to strengthen awareness of the sector and the career opportunities it presents. Working with Scotland's Regional Developing Young Workforce Groups, Skills Development Scotland will strengthen Industry and School Engagement across the sector with a strong focus on the Regional Clusters. Employers in Scotland should make full use of this service to engage with potential recruits in their local communities.

Employers in Scotland are supported by career education, information, advice and guidance (CIAG) services to address future skills demands and deliver inclusive growth. Scotland has an all-age, inclusive national careers service delivered by Skills Development Scotland which operates alongside services delivered by other partners. The organisation has careers advisers based in every state secondary school in Scotland, including additional support need schools. Employers can also advertise Apprenticeship Opportunities on Apprenticeships.Scot.[29]

Employers can utilise Marketplace[30] an online platform to connect businesses with education. It has been developed with Scotland's Developing Young Workforce Network, enabling employers to make offers of Skills Sessions, Inspiration Events and Career insights, and teachers can draw down these requests to meet curriculum and pupil needs.

[29] *https://www.apprenticeships.scot/*

[30] *https://www.skillsdevelopmentscotland.co.uk/supporting-scotlands-employers/marketplace/*

Annex C: The UK skills system

In the UK, skills are a devolved matter, which means that governments in each nation have control over the design and function of their education systems. Skills funding and infrastructure in each nation present opportunities that must be harnessed by employers operating in them. The skills products that we would signpost to shipbuilding employers in each nation are detailed in this annex.

ENGLAND

Apprenticeships

Apprenticeships are paid jobs, which give thousands of people the opportunity to gain the skills and on-the-job experience needed to hit the ground running in their chosen profession. There are options to train at every level right up to degree level, within UK shipbuilding organisations. Alongside on-the-job training, apprentices spend at least 20% of their time in off-the-job training with a training provider, such as a college or university, learning skills and building confidence for the workplace. Although applicants must be over 16 to take an apprenticeship, an apprenticeship can be started at any age. This means apprenticeships are not only for career starters, they also offer a pathway for people to change career or upskill in their current job.

Flexible Apprenticeships

We know that workforce planning is a particular challenge for shipbuilding employers who navigate cycles of boom and bust and may work from contract to contract. This is an even greater challenge for small and medium enterprises, who operate with smaller margins and headcount. This can make apprenticeships feel inaccessible, as it can be difficult to commit to employing and supporting someone for the duration of the apprenticeship. Flexible apprenticeships, particularly the flexi-job apprenticeship scheme[31], are an opportunity that we recommend shipbuilding employers utilise.

Under this model, a Flexi-Job Apprenticeship Agency employs the apprentice directly for the duration of their apprenticeship and arranges placements at host businesses for their practical training. This reduces the burden on host businesses, who can commit to employ an apprentice for a shorter period when they know there will be enough work for them. It will therefore enable more employers to benefit from apprenticeships, grow the training pipeline into shipbuilding, and give apprentices a more diverse training experience.

Degree Apprenticeships

Degree Apprenticeships provide an approach that allows people to start work, earn a wage, complete a part-vocational, part-academic qualification that is transferable, and do this whilst making a contribution to the shipbuilding industry. In addition, increasing participation at higher skill levels may enable people to develop and progress in their careers, attracting candidates to the sector who may not have otherwise considered a career in shipbuilding.

The Institute for Apprenticeships and Technical Education (IfATE)

IfATE[32] aims to make sure apprenticeships and technical education are of the highest quality to give every employer and individual the skills they need to succeed. To deliver this, IfATE works with employers to develop, approve, review and revise apprenticeships and technical qualifications, putting employers at the heart of the system and making it easier to navigate for all.

Expert guidance is sought from thousands of large and small employers to deliver world-class apprenticeships, T Levels, and higher technical qualifications. All apprenticeships and T Levels are based on occupations recognised by employers. IfATE has worked with employers

[31] *https://www.gov.uk/guidance/flexi-job-apprenticeship-offer*

[32] *https://www.instituteforapprenticeships.org/about/what-we-do/*

to build over 600 occupational standards across 15 occupational routes. An occupational standard is a description of an occupation. It contains a profile, and describes the knowledge, skills and behaviours needed. There are 15 sectors that IfATE calls occupational routes. These standards and routes are brought together in an occupational map[33]. The occupational maps show where technical education can lead.

Skills Bootcamps

Skills Bootcamps are free, flexible courses of up to 16 weeks, giving people the opportunity to build up sector-specific skills, with an offer of a job interview with an employer on completion. Skills Bootcamps have the potential to transform the skills landscape for adults and employers. There are now more than 1000 Skills Bootcamps available across the country, offering training in digital, technical (including engineering and manufacturing), construction, logistics (HGV driving), and skills that support the green economy (including heat pump engineering and electric vehicle maintenance and repair, and zero carbon construction). As part of government plans to expand Skills Bootcamps, a model is being developed that will support learners to progress onto an accelerated apprenticeship in digital, technical, green and construction.

Engaging Institutes of Technology (IoTs)

IoTs are a place-based collaboration between universities, Further Education providers and employers across England, designed to ensure that provision responds to local employer need. They primarily provide higher technical education, with a focus on STEM subjects. They can be used for upskilling and reskilling, as well as starting a career.

Shipbuilding is a highly regionalised sector, with a particular need for STEM skills. The IoT network is a new initiative that has high potential to benefit our sector. The UK Shipbuilding Skills Taskforce recommends that employers with an IoT in their area seek to join as an employer partner, so they can shape and utilise their local provision.

The Education Hub

The Education Hub[34] is a site for parents, pupils and education professionals that provides up to date information the education system in England, giving accessible, straightforward information on popular topics, Q&As, interviews, case studies, and more.

WALES

Higher and Degree Apprenticeships

The Welsh Government is investing in apprenticeships to help employers to drive productivity and economic growth. Apprenticeships are responding to skills gaps and supporting growth in technical and STEM jobs. Higher and degree apprenticeships are prioritised in technical sectors where there are skills gaps and shortages. Degree apprenticeships are offered in the digital, advanced manufacturing and engineering sectors, all supporting the shipbuilding supply chain.

Shared Apprenticeships

The Shared Apprenticeship programme provides new opportunities for people who cannot find permanent employment to learn new skills in the workplace and to gain qualifications that will enable them to gain and sustain full time permanent jobs. They are available across all regions of Wales in all sectors with schemes running in engineering, creative and digital media. Under this model apprentices are employed by an employing organisation that is responsible for the recruitment, employment and welfare of the apprentice who completes their apprenticeship at host employers who are not able to offer a full-term apprenticeship but are able to offer the on- job learning required by the apprenticeship framework.

[33] *https://occupational-maps.instituteforapprenticeships.org/*

[34] *https://educationhub.gov.uk/*

Shared Apprenticeship support is primarily for:

- employers in sectors with evidenced skills shortages/gaps and/or low levels of apprenticeship starts;
- Small and medium enterprises who are unable to employ an apprentice on a full-time basis; and
- young people (16-24 yrs. old) from disadvantaged and/or under-represented groups with evidenced barriers to accessing apprenticeships.

Personal Learning Accounts

Personal Learning Accounts provide flexible courses and qualifications in priority areas to individuals already in employment to allow them to reskill and upskill. They focus on sectors that are growing and where there is currently a need for people with these skills. The energy, engineering and manufacturing sectors have been prioritised. They are designed to be flexible and work around people's life and commitments. The goal is that at the end of the course or courses, there will be well-paid job vacancies available to apply for.

The Flexible Skills Programme

The Flexible Skills Programme provides financial support to employers towards upskilling staff, including addressing skills gaps in the engineering and manufacturing sectors.

Junior Apprenticeships

The Junior Apprenticeships Programme is a two-year programme which has been developed to offer Year 10 and Y11 learners (aged 14-16) the opportunity to gain a Level 2 qualification alongside hands-on work experience. It enables learners to become employable; with the skills to progress onto a higher-level vocational course or apprenticeship at the age of 16.

The Programme, delivered by Further Education institutions in close collaboration with schools and local authorities, supports learners to undertake GCSEs in Maths and English or (First Language) Welsh whilst studying for a Level 2 qualification in a range of vocational pathways. The Programme helps to raise the profile of apprenticeships as a pathway into employment and develops relationships with businesses and training providers so that learners are equipped with the skills and competences to be work ready.

Business Wales

This service provides free independent advice to employers, including employability and skills support to enable employers to recruit new apprentices as well as develop the skills of their current workforce to meet business needs.

NORTHERN IRELAND

ApprenticeshipsNI (Levels 2 and 3) and Higher Level Apprenticeship (Level 4+) schemes

Apprenticeships at all levels provide a skills pipeline for employers, across many sectors aligned to shipbuilding. Both schemes include apprenticeships in a range of engineering disciplines in addition to others in support of the sector and also provide progression routes, from Level 2 through to Level 7.

Traineeships

Further Education college-delivered NI Traineeships support those who are not yet in employment to gain knowledge and skills at Level 2 to prepare them for employment in various occupational areas.

Sectoral Partnerships

The Advanced Manufacturing and Engineering Sectoral Partnership is an employer-led body which looks to ensure that the content of traineeships and apprenticeships meet the current and future needs of industry whilst ensuring pathway progression routes are available.

Skill Up

The Flexible Skills Fund provides fully funded courses to all Northern Ireland citizens aged 18 and older. Accredited qualifications at level 1 to level 7 are delivered by Higher Education and Further Education institutions, encouraging the development of transferable skills across sectors.

Assured Skills

The Assured Skills programme is a demand-led, pre-employment training programme that helps individuals gain the skills they need to compete for guaranteed job vacancies, with both new Foreign Direct Investment (FDI) companies and expanding locally based businesses. Academies are delivered by local Further Education and Higher Education institutions and provide industry- focused training to equip participants with transferable skills sought by companies. The Academy model is designed to be a short, sharp, versatile intervention which will provide the participants with up-to-date, industry relevant skills that are transferable across many sectors.

Curriculum Hubs

Since 2018 the establishment of the seven Curriculum Hubs in key occupational areas (Engineering & Advanced Manufacturing, Digital IT, Construction, Health & Social Care, Life Sciences, Hospitality & Tourism and Entrepreneurship) focussed on priority skills and growth sectors of employment.

The Curriculum Hubs concept aims to ensure as a result of the activity driven by the Hub Action Plans, the curriculum delivered is high quality, consistent, current and responsive to the needs and demands of each industrial area thereby increasing opportunities for economic development and performance in each field. The role of many of these Hubs, e.g. but not limited to Construction, Engineering & Advanced Manufacturing & Digital IT in particular will play a very important role in supporting skills development relating to shipbuilding.

Invest NI

Invest NI[35] provides additional support including:

- Leadership training and mentoring to support businesses to develop their strategic leadership capacity;
- Skills support to boost business productivity and increase profits by improving the skills of managers & employees;
- Skills development opportunities for businesses, for example Practical Export Skills Workshops to give emerging exporters the opportunity to develop their knowledge of exporting processes and help more experienced exporters refresh and update their understanding of best practices; and
- Workshops on Training Needs Analysis to give employers the tools they need to increase productivity and improve the skills of their workforce through targeted training going forward.

SCOTLAND

There is a coherent Regional Network of Colleges, structured by design to align with employers and schools and providing learning pathways through to employment and higher education. The sector is also supported by Independent Training Organisations and Group Training Associations. Whilst current levels of engagement and investment by key employers has been strong this needs to increase and extend across key supply chains and in the regional clusters that exist.

Foundational Apprenticeships and NPAs

Foundation Apprenticeships and National Progression Awards are creating stronger Vocational Pathways from the Senior Phase in School in partnership with colleges, local authorities and employers. Current activity with a focus on fabrication and welding has

[35] *https://www.investni.com/support-for-business*

highlighted the positive career prospects and enabled a much stronger performance on equality and diversity measures.

Modern and Graduate Apprenticeships

Modern and Graduate Apprenticeships across the Vocational Frameworks are required within the shipbuilding sector and supply chain. Frameworks have benefitted from the creation of Technical Expert Groups (TEGS) to refresh and update qualifications, resulting in the creation of a Modern Apprenticeship in Engineering and Digital Manufacturing at SCQF Level 8 and a Graduate Apprenticeship in Engineering: Design and Manufacture.

Further and Higher Education Provision

Scotland has a rich provision of skills provision within its tertiary education sector, providing Naval Architecture, Ocean and Marine Engineering. Scotland is working with employers to increase awareness and connectivity to these world class facilities and learning resources.

Workforce Planning

Skills Development Scotland works with the Regional Enterprise Agencies to deliver the Skills for Growth service helping employers to develop progressive workforce development plans aligned to business objectives and follows up through Account Managed Relationships to assist with fulfilment of the plans.

Career Transition Model

The Career Transition Model has been developed with Industry, the Skills Agencies and Regional Colleges to increase the number of mature career changers, and has supported the delivery of successful collaboration such as Babcock International's Production Support Operative.

Individual Training Accounts

Individual Training Accounts offer small grant support to help individuals upskill and improve job prospects.

TASKFORCE MEMBERSHIP

The Taskforce was set up by the Department for Education, working closely with the National Shipbuilding Office, with 19 members drawn from across the UK including representation from industry, trade unions and training providers.

Paul Little CBE, Principal and Chief Executive, City of Glasgow College (Chair)

Dr Paul GK Little is the founding Principal and CEO of City of Glasgow College - Scotland's Super College - for up to 40,000 students, across 2000 programmes in 40 technological disciplines. A Harvard Business School graduate and distinguished academic, published author, global skills expert, system leader and respected Mariner; recognised with six Fellowships including the Royal Society of Edinburgh (Scotland's Learned Academy).

For 35 years he has successfully led and reshaped five UK colleges earning an international reputation as a visionary reformer, successful change agent, merger specialist and a much sought after thought leader in redefining college education.

He is a Younger Brother of Trinity House, Fellow of the Nautical Institute, Chair of the UK Merchant Navy Board's Futures Committee, and member of; the UK Merchant Navy Training Board, UK Chamber of Shipping, Merchant Navy Association, the Royal Navy's Strategic Studies Board and Navy Command. He is a Board Member of the Scottish Maritime Cluster, and helped shape the Scottish Government Maritime Strategy.

He is a veteran HM Coastguard Officer (30 years) holding various roles including being selected as part of an elite team to train with the US Coastguard and completed three tours of duty, subsequently made an Honorary Member of the US Coastguard (Fifth District).

He is a qualified yacht skipper, sailing his ELAN 434 in the Mediterranean. Most recently he was appointed by HM The Queen to the senior rank of Honorary Royal Navy Captain and Chair of the UKSST.

Adrian Bevin, Head of Curriculum, Technology, South Devon College

Over the past 17 years Adrian has worked within the education sector, 13 of those years have been focused on designing and implementing a broad maritime curriculum that complements the wider sector's needs. This involved working alongside industry representatives, businesses, and key stakeholders, to understand the challenges with regards to skills gaps, recruitment and their relationship towards productivity and success.

Adrian has worked with various awarding bodies to influence funded training programs that provide a platform to deliver a high quality of education for individuals, from 14 – 60 years of age, that are either new entrants, upskilling or transferring from other sectors.

Examples of this activity have covered the following disciplines: Marine Engineering; Boatbuilding; Composites; Maritime Skills; Yacht Operations; and Naval Architecture.

The academic range of this development has been from post GCSE Level 1, 2 and 3, Foundation Degree and more recently Higher and Degree Apprenticeships up to Level 6.

Adrian's current role is Head of Technology, which covers Automotive, Marine, Engineering and Construction Management. With a wider view of those technology-based sectors Adrian has been able to identify areas of best practice and use this to inform curriculum design based on emerging sector needs and industry trends.

Adrian has recently been appointed as Chair for British Marine South West, having been an active Board Director since 2013. Adrian is also a Trustee of Open Awards, Liverpool since 2014.

Matt Bolton, Chief Executive Officer, UKNEST

Matt Bolton joined the Royal Navy in 1981 as an apprentice and served at sea in frigates and destroyers and ashore in training, acquisition and support roles, including a 2-year secondment to industry. In his final appointment he was responsible for engineering strategy and policy, as well as leadership of the Royal Navy's contribution to the national Year of Engineering 2018 campaign.

Retiring from the Royal Navy in February 2020, Matt established MTWB Consultancy Ltd, offering independent consultancy services to the maritime defence enterprise. In September 2021 he started a part-time role with United Kingdom Naval Engineering Science & Technology (UKNEST) to promote the engineering, science and technology interests of UK Naval Defence. Uniquely, UKNEST provides an environment for all member organisations, private and public, to explore the challenges and opportunities faced by the sector, whilst encouraging early careers engagement and providing advocacy and advice to policy makers.

Matt is also chair of the IMarEST's Naval Engineering Special Interest Group and chair of Warsash Sea Cadets "TS TORMENTOR".

Edward Corbett, Project Engineer, representing Irish Congress of Trade Unions (ICTU)

Eddie joined Harland and Wolff in 1982 aged 16 as an apprentice Fitter, his career progression spans almost 40 years and has involved several roles in the multi-faceted world of shipbuilding and marine engineering. Although mostly working within a design/engineering environment, Eddie has spent several years in operational positions, including ship repair management and commissioning of new buildings.

Throughout this time, he has acquired a depth of technical and operational knowledge, understanding and appreciation of shipbuilding skills and disciplines beyond his Control and Instrument background.

Experience has been gained through active involvement in all project phases from bidding activities, estimating through to FEED studies, commercial appraisals, design engineering, installation/integration, commissioning/sea-trials and hand-over to post-delivery support and maintenance.

When Harland and Wolff entered Administration in July 2019, Eddie became a union rep for Unite the Union and, along with many others, actively campaigned to save the yard and preserve the skills.

Eddie is representing the Irish Congress of Trade Unions (ICTU) as an umbrella body for both unions in the yard, Unite and GMB.

Andrew Cree, Deputy Director Future Training, Royal Navy

Commodore Andy Cree has spent most of his Royal Navy career in training and education. He successfully completed a Cranfield MBA in 2000 and attended the Advanced Command and Staff Course in 2002-2003 gaining an MA in Defence Studies and becoming Fellow of CIPD. Whilst Head of Training and Education at the Defence Academy he moved in June 2014 to become the project lead to build a University Technical College in Portsmouth and start Navy STEM. He was Head of Training and Education (Navy) in November 2016 and assumed Deputy Director Future Training in January 2020. Having just completed a £1.3bn outsourcing for training transformation he is currently leading a major tri-service recruiting procurement. During this time, he established the Solent Maritime Enterprise Zone. Currently undertaking the Oxford University Major Projects Leadership Academy, he is Chair of a Multi Academy Trust and a Director of Maritime UK Solent.

Sarah Dhanda, Head of Policy and Partnerships, Enginuity

Sarah joined Enginuity (then SEMTA) in October 2018 as Head of Strategic Partnerships following a successful career in the Marine sector, where she worked for many years latterly as Chief Officer of Membership and Services at British Marine, the trade Association for the marine sector.

Sarah's background is in skills and she initially joined British Marine as Director of Training Services to head up their apprenticeship and qualifications development activity. Prior to joining British Marine, Sarah worked at City and Guilds where she was the Sector Manager for IT and Business qualifications.
Sarah sits on the Made Smarter Strategic Implementation Group (SIG) and takes the lead within Enginuity on the emerging digital skills needs of the sector. One of her key objectives is the sharing of knowledge and good practice across sectors to ensure connectivity on key skills and workforce development challenges.

The Enginuity group is a not-for-profit organisation responsible for engineering skills for the future of the UK's most advanced sectors. Led by employers, its job is to transform the skills and productivity of the people who power our engineering and advanced manufacturing technologies sectors, enabling UK industry to compete on the global stage.

Paul Feely, Academy and Engineering Director, BAE Systems Naval

Paul Feely is the Academy and Engineering Director for BAE Systems Naval Ships.

Educated at Glasgow University, he has worked across BAE Systems Naval and Submarine businesses in projects at all stages of the lifecycle from design and build to in-service support with the UK MoD and navies from across the globe.

With 30 years' experience in naval engineering and shipbuilding Paul believes that the UK, as a whole, has all the right ingredients for a successful, vibrant and international significant capability.

The strategic focus of his current role is to elevate learning and development within Naval Shipbuilding by establishing an Applied Shipbuilding Academy to deliver capabilities that ensure current and future employees can perform, innovate, and grow in priority areas of strategic importance to the shipbuilding.

Paul also acts as Engineering Authority for BAE System Naval Ships. He is a Chartered Engineer, a Fellow of the Institute of Engineering and Technology (IET) and an Honorary Member of the Royal Corps of Naval Constructors (RCNC).

Kerrie Forster, CEO, Workboat Association

Kerrie's 19-year professional career has been dedicated to both onshore and offshore roles within various maritime industries. He is an industry consultant and CEO of the Workboat Association - "The trade association for Workboat Owners, Operators, Stakeholders and Professionals" and Non-Executive Director of Maritime UK - "The collective voice for the UK's maritime industries".

Once a workboat vessel Master, he has offshore experience within Offshore Energy, Survey, Dive support, Civils and Dredging markets. Kerrie spent a number of years managing a fleet of workboats for an Internationally operating company based in the Netherlands and has gained his experience from working across the globe.

With a strong background in nurturing a well-accepted safety culture, responsible work ethics and cross organisation understanding, he has designed and created a number of maritime management systems; including Operational and QHSE documentation, processes and controls to ISO/OHSAS/IMO certification. He has also played a part in significant incident and accident investigations both internally and externally.

Though specialising in vessels below 500gt, he is an ISM lead auditor with experience inspecting, auditing, and training on board larger convention vessels.

Currently living in Rotterdam NL, Kerrie actively represents the Workboat Industry and wider Offshore Contracting Sector speaking at and Chairing working groups and conferences, providing guidance and research to many National and International publications, campaigns and Government strategies. Motivated in supporting and mentoring all industry stakeholders from Regulators to Apprentices. Kerrie is also a member of the UK Maritime Council, Clean Maritime Council and a Board member of the Maritime Skills Alliance.

Matthew Guy, Human Resources Director, Thales UK

Matthew is currently HR Director, Business Growth for Thales UK and has held operational and functional HR Director roles within Thales since 2013.

As an HR professional for the past 25 years Matthew has provided HR leadership across a range of professional services, projects and product development businesses within Thales with a focus on delivering quality and timely outputs that fulfil customer requirements and generate technical, economic and social value.
His work has included identifying, developing and sustaining capacity and capability across multiple industries including surface ships (particularly the Aircraft Carrier Alliance), Submarines (sonar), Secure Communications and Cyber Security.

Matthew holds a degree in Personnel Management from Plymouth University and is a Member of the Chartered Institute of Personnel and Development.

Bob King, National Secretary Defence, Prospect Trade Union

Bob has been a full-time trade union officer for over 35 years, previously with the Communication Workers Union and moving to Prospect in 2003. Bob has held various posts working with national and international employers in the nuclear, energy and defence sectors.

Bob studied employment law at LLM through the University of Surrey and has also taught on several subjects to both trade union representatives and employers.

Bob was appointed Head of Prospect's Defence Industry Group in 2020, having been National Officer for defence employers. He leads a team of organisers and negotiators across the defence sector.

Bob is the Confederation of Shipbuilding and Engineering Unions (CSEU) 's Lead for Defence. The CSEU affiliates include Prospect, GMB, Unite and Community covering over 200,000 UK employees.

Rachel Kitley, Principal, Cowes Enterprise College, Ormiston Academies Trust

Rachel Kitley is the Principal of Cowes Enterprise College, an Ormiston Academy, which is based on the Isle of Wight. The academy has undergone rapid improvement under Rachel's leadership, with half of students heading to world-leading Russell Group universities, including Oxbridge, just seven years after it was rated as failing. It is now ranked as the best on the Island for the progress students make and has received widespread praise for the innovative approach to education being championed.

A standout achievement during Rachel's time at Cowes has been her success in implementing and promoting Maritime Futures, a curriculum that the academy has developed in collaboration with the sector to help students develop skills and access opportunities in the maritime space. In recognition of this success, the academy was awarded the prestigious Maritime UK Award for Future Skills, as well as being visited by the Permanent Secretary for the Department for Education.

Rachel moved to the Isle of Wight in 2017 to take up the role of Principal. Prior to joining Cowes, Rachel held a number of leadership and teaching roles, including being the Co-Headteacher at Kingsbury High School in London, with over 2000 students on roll and which achieved above average Progress 8 during her time in this role.

Aside from teaching, Rachel has long shared advice, guidance and best practice across the sector, including regularly writing for TES on effective practices in the classroom and also writing curriculum resources for Heinemann. Rachel also presents at both national and international conferences on a range of educational topics.

Keith Longman, Yard Manager, Berthon Boat Company Ltd

Having started his career as a Marine Engineering apprentice, Keith is an industry professional with 30+ years of working knowledge in the commercial and leisure marine sectors. Keith has extensive senior management experience, specialising in Marine Engineering operations, health and safety, facilities management, contractor management, HR, apprenticeships, defence security and ISO systems, providing support for all companies in the Berthon group. Keith has Chaired British Marine training services committee and Boatbuilding, Marine Engineering and Marine Electrician apprenticeship standard employer groups. Keith is an honorary member of The City & Guilds of London Institute, having undertaken work on many City and Guilds qualifications, producing updated handbooks, assessment materials and guidance for centre devised practical tasks, and previously assisting SEMTA in updating the National Occupational Standards. As a Liveryman of the Worshipful Company of Shipwrights, Keith sat on the Shipwrights Apprenticeship Scheme committee providing companies with funding for first year apprentice wages and has recently become a member of the Shipwrights Lecture committee. He is also a Careers Enterprise Advisor at his local senior school and in 2014 was voted by the Manufacturer magazine as one of the top 100 most inspirational manufacturing leaders in the country.

Nick Mansell, Chief Executive Officer, Intermarine UK

Nick is a Naval Architect by trade, having completed his Masters Degree with First Class Honours at the University of Southampton in 2008. He worked extensively across the build of the Royal Navy's Aircraft Carriers from 2011-2015 before completing his MBA in 2018. Nick has a passion for large projects and has worked across multiple infrastructure sectors in the UK including Shipbuilding, Offshore Wind and Rail. Nick has a particular interest in using Industry 4.0 to bring increased transparency across project planning, commercial, assurance and overall delivery management.

Nick is the Chief Executive of Intermarine UK and a powerful advocate for Engineering having developed broad experience across the sector. He is a Trustee of The Brunel Museum in London, which aims to increase engagement in STEM subjects across underrepresented demographics.

Nick is focussed on the development of UK skills across Shipbuilding and Project Management Trades, working with suppliers and client alike to support Apprentice opportunities across the industry.

Jim McHarg, HR Director, Marine and Engineering Systems, Babcock International Group

Jim began his working life as an engineering apprentice at Weir Pumps Ltd, Glasgow and from there has taken up a number of executive roles within a variety of large engineering companies including BAE Systems and the Weir Group.

In 2005, he moved into the world of Human Resources and he is currently HR Director, Marine and Engineering Systems with Babcock International Group where he has the responsibility of leading strategic HR initiatives, including employee relations, communications and engagement, learning and organisational development. His passion is focussed around developing organisations and the people within them to deliver sustainable business growth.

He is a former President of Glasgow Chamber of Commerce and is a Council Director. He currently Co-Chairs the Glasgow Employment and Skills Board and is Chair of the DYW Regional Chairs for Glasgow, West, Lanarkshire and East Dunbartonshire with a focus on broadening education and employment opportunities for everyone, regardless of background, across the regions.

Jim is a qualified mechanical engineer from the University of Strathclyde and a fellow of the Institution of Mechanical Engineering and the Chartered Institute of Personnel and Development.

Hannah Prowse, CEO, Portsmouth Naval Base Property Trust

Hannah is the CEO of Portsmouth Naval Base Property Trust, landlord of the Portsmouth Historic Dockyard, custodians of the Memorial Flotilla and operators of the International Boatbuilding Training College in Portsmouth. Previously Head of National Projects for English Heritage and Preconstruction Manager of Sir Robert McAlpine Special Projects, Hannah led an industry-wide initiative to tackle the skills shortage in heritage construction, pulling together stakeholders, governing and funding bodies across the sector. As a Skills Ambassador for the Association of Heritage Engineers, Hannah is keen to work across industries to learn from each other and to find examples of best practice.

Linton Roberts, Chief Technology Officer, Cammell Laird Shiprepairers and Shipbuilders Ltd and A&P Group Ltd

Linton was educated at Ysgol Friars, Bangor, before studying Naval Architecture at the University of Strathclyde in Glasgow.

Joining Cammell Laird in 1994 as a graduate Naval Architect, he has since worked in variety of technical, production, project management and senior management roles, including Managing Director of the Shipyard between 2008 and 2018.

Linton has been heavily involved in all shipbuilding programmes at the yard since the late 1990's including the delivery of modular upper blocks for both Queen Elizabeth Class Carriers, multiple commercial ROPAX vessels and most recently the RRS Sir David Attenborough as the Senior Executive Responsible.

Linton's current role of Group Chief Technology Officer (CTO) for both Cammell Laird and A&P Group sees him oversee all executive decisions with regards to business development and marine technology interests including skills.

Linton has a particular interest in the Graduate and Apprentice training programmes for both businesses, focussing on the development of people to support the future National Shipbuilding Strategy.

Linton is currently a Maritime Skills Commissioner; is a former member of the Lloyds Register Technical Committee and also Board member of his local community hydroelectric scheme.

Dr Tahsin Tezdogan, Associate Professor in Maritime Engineering, University of Southampton

Dr Tezdogan is currently an Associate Professor in Maritime Engineering at the University of Southampton. He received his PhD degree in 2015 from the University of Strathclyde's Naval Architecture, Ocean and Marine Engineering Department. Dr Tezdogan has a broad range of research interests, including energy efficient ship design, ship motions and resistance, the added resistance of ships due to waves, and the investigation of ship behaviour and performance in channels/canals. To date he has worked on many research and knowledge exchange projects and published his research outputs in a number of scientific journals and conferences. Dr Tezdogan is leading a research team at Southampton University working on clean, safe and efficient maritime transportation. He is also the Editor-in-Chief for Ocean Engineering journal and a member of ITTC's Quality Systems Group. Dr Tezdogan is also a Professional Affairs and Education Committee member of the Institute of Marine Engineering, Science & Technology.

Richard Westgarth, Industry Engagement, BMT MarRI-UK, and Adjunct Professor, Southampton Marine and Maritime Institute

Richard has over 40 years of experience in the defence and maritime sectors as an innovation strategist and business adviser. His wealth of experience in naval and defence domains builds on his earlier work in research, innovation, change management and consultancy. Richard has a horizon-scanning role across the BMT organisation, looking at medium to long term trends. This embraces emergent and disruptive technologies. He has been active developing the MarRI-UK initiative and chairs their technology working group. With colleagues from SMMI and Lloyds Register, Richard co-authored the 'Global Marine Technology Trends 2030' series of reports working alongside students and researchers. He led on skills work for the Maritime Enterprise Working Group. He sits on the Innovation Committee of the Royal Institute of Naval Architects, Transport Executive of the IET and the Maritime UK People and Skills Forum. Richard is Adjunct Professor at the Southampton Marine and Maritime Institute.

Mark Whitehead, Commercial Manager, Windcat Workboats Ltd

Mark has been in the offshore renewables industry for the past 15 years and started his career with a training organisation developing young

people's skills to enter the industry. Mark then worked for an offshore diving provider before moving to Bibby Marine just as they launched their first innovative Walk 2 Walk vessel and overseeing the build of their second walk to work vessel.

Mark is passionate about shipbuilding and renewable energy, and can see that there is a severe shortage of vessels required to deliver ambitious energy transition goals.